REQUEST FOR PROPOSAL (RFP)

"THIS PROCUREMENT IS UNRESTRICTED"

PROJECT:	**INDEFINITE DELIVERY INDEFINITE QUANTITY CONTRACT FOR REPAIRS AND ALTERATIONS AT VARIOUS LOCATIONS FOR THE STATE OF INDIANA**
PROJECT NUMBER:	**RIN00015**
VOLUME:	**II of III** **TECHNICAL SPECIFICATIONS**
SOLICITATION NUMBER:	**GS05P00GAC0237**
ISSUE DATE:	**JULY 26, 2000**
CLOSING DATE & TIME:	**AUGUST 28, 2000** **4:00 P.M. (Chicago Time)**

◆◆

CONTRACT NUMBER:

DATE OF AWARD:

ISSUED BY:

General Services Administration
Public Buildings Service
Contracts Branch (5PMC4)
230 South Dearborn Street,
Suite 3324 Mailstop 33-3
Chicago, Illinois 60604

SECTION 01010 - SUMMARY OF THE WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and conditions of the construction contract, including but not limited to General Conditions, and the Special Conditions listed below, apply to work of this section.

Section 00120,	Supplementary Instructions to Bidders
Section 00800,	Supplementary Conditions
Section 01010,	Summary of the Work. **(Section Index)**
Section 01040,	Project Coordination.
Section 01045,	Cutting and Patching.
Section 01090,	Definitions and Standards.
Section 01205,	Procedures and Controls
Section 01340,	Submittals.
Section 01505,	Temporary Facilities.
Section 01546,	Safety and Health.
Section 01605,	Products.
Section 01705,	Project Closeout.
Section 02070,	Selective Demolition.
Section 02085,	Asbestos Abatement Proceedures
Section 02086,	Asbestos Containment Control
Section 06200,	Carpentry.
Section 08110	Steel Doors and Frames.
Section 08210,	Wood Doors.
Section 08510,	Steel Windows.
Section 08700,	Finish Hardware.
Section 08800,	Glass and Glazing.
Section 09250,	Gypsum drywall.
Section 09510,	Acoustical Ceilings.
Section 09520,	Acoustic Wall System.
Section 09650,	Resilient Flooring.
Section 09680,	Carpeting.
Section 09900,	Painting.
Section 09950,	Wallcoverings.
Section 10618,	Demountable Metal Panel Partitions
Section 12500,	Window Treatment.
Section 15325,	Standpipe and sprinkler system.
Section 15720,	Low pressure Ductwork
Section 15760,	Testing, Adjusting, and Balancing.
Section 16020,	Raceways.
Section 16050,	Basic Materials and Methods.
Section 16121,	Control/Signal Transmission Media.
Section 16135,	Electrical Boxes and Fittings.
Section 16143,	Wiring devices.
Section 16470,	Panel Boards.
Section 16510,	Interior Building Lighting.

1.2 WORK OF THE CONTRACT; RELATED DOCUMENTS:

A. Contract documents (GSA Form 300, "Delivery Order"), indicate the work of contract, and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the contract documents include, but are not necessarily limited to, the following:

1. Existing site conditions and restrictions.

2. Other work prior to work of contract.

3. Alterations and coordination with existing work.

4. Other work to be performed concurrently by Government.

5. Other work to be performed concurrently by separate contractors.

6. Other work subsequent to work of Contract.

7. Items furnished by the Government and installed by Contractor, (Government Reserved item).

B. Summary by References: Work of Contract can be summarized by reference to the conditions of the contract, specification sections as listed in the "Index of Specification Sections" bound herewith, drawings as listed in "Schedule of Drawings" (if used), addenda and modifications to the contract documents issued subsequent to the initial printing of this project modicfication, and including but not necessarily limited to printed matter referenced by any of these.

C. Abbreviated Written Summary: Briefly, and without force and effect upon contract documents, work of contract can be summarized as follows:

The work to be performed under terms of this contract include but is not limited to: general office renovation and construction; wall partition construction, modification and alteration of floor and wall mounted telephone, signal, and power outlets to included the modification of associated conduit, surface mounted raceway, and various underfloor duct systems; installation of new and the alteration of existing power panels; carpet and carpet tile installation; painting; HVAC duct work modification and repair; door, door frame, and door set hardware installation; installation of various wall coverings and draperies; communications cabling; grid ceiling and lighting installation and modification; modification of existing building fire sprinkler systems; plastering and plaster repair work; and other such related work as noted throughout this package, and which is specifically listed on the delivery order and job drawings.

1.3 ITEMS FURNISHED BY THE GOVERNMENT AND INSTALLED BY THE CONTRACTOR

A. General: Refer to clause "Government Furnished Property" of Construction Contract Clauses (Fixed Price).

B. Notification: Within five (5) calendar days after issuance of a Delivery Order submit to the Contracting Officer a schedule in giving desired dates for delivery of items furnished by the Government. Schedule shall be subject to written approval of the Contracting Officer. Approved dates of delivery shall be confirmed five (5) days prior to delivery by the Contractor.

C. The Contractor shall transport, with his own forces, all items described as "Government Furnished" on the Delivery Order, Price Schedule or in the specifications that are required for each installation from a storage area within the building.

D. The Contractor shall receive the items as delivered by the Government, uncrate, assemble, locate in place and install or connect ready for continuous operation. Assembly shall include such projecting parts and loose fittings as are usually shipped detached. Installation or connection shall be in accordance with the respective sections of the specifications which are involved and shall include the necessary fitting of adjacent work and any additional labor and material required therefore.

E. Installation: Installation shall be as specified for each item.

WORK LOCATIONS:

Location #1:	Federal Building/U.S. Cthse, 1300 S. Harrison St., Fort Wayne, IN 46802
Location #2:	Federal Building/U.S. Cthse, 46 E. Ohio St., Indianapolis, IN 46204
Location #3:	Charles A. Halleck Federal Building/U.S. Cthse, 230 N. Fourth St., Lafayette, IN 47901
Location #4:	Federal Building/U.S. Cthse, 121 W. Spring St., New Albany, IN 47150
Location #5:	Minton-Capehart Federal Building, 575 N. Pennsylvania, Indianapolis, IN 46204
Location #6:	Major General Emmett J. Bean Federal Center, 8899 E. 56th St., Indianapolis, IN 46249

1.4 CONTRACTOR USE OF PREMISES

A. General: The Contractor shall limit his use of the premises to the work indicated, so as to allow for Government occupancy and use.

1. Use of the Site: Confine operations at the site to the areas permitted under the Contract and/or listed on the Delivery Order. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project construction. See "Project Coordination" section.

2. Contractor Use of the Existing Building: Maintain the existing building in a safe and weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period. See "Project Coordination" section.

a. For use of existing toilets, see "Temporary Facilities" section.

3. Use of Existing Elevators: See "Temporary Facilities" section.

1.5 GOVERNMENT OCCUPANCY

A. Full Government Occupancy: The Government will occupy the site and the existing building during the entire period of construction. Cooperate fully with the Government representative during construction operations to minimize conflicts and to facilitate Government usage. Perform the work so as not to interfere with the Government operations.

1.6 INSPECTION BY REGULATORY AUTHORITIES

A. This project is subject to inspection by the following regulatory authorities:

GENERAL SERVICES ADMINISTRATION,
575 N. Pennsylvania, Indianapolis, IN 46204

-or-

The designers assigned by the Contracting Officer or Contracting Officer's Representative.

1.7 MISCELLANEOUS AND GENERAL PROVISIONS

A. Existing Structures: Shall remain in place.

B. Items so shown or scheduled will remain the property of the Government. Store

C. New Work: Unless otherwise noted on drawings or specified, new work in extension of existing conditions shall correspond in all respects with that to which it connects, or to similar existing conditions, in materials, workmanship, and finish.

D. Alterations to Existing Work:

1. Existing work shall be cut, drilled, altered, removed, or temporarily removed and replaced as necessary for performance of work under the contract. Work that is replaced shall match similar existing work. Structural members shall not be cut or altered, except where noted on drawings, without authorization of the Contracting Officer. Work remaining in place which is damaged or defaced during this contract shall be restored to the condition existing at time of award of contract.

2. Discolored or unfinished surfaces exposed by removal of existing work and indicated to be the final exposed surfaces shall be refinished or the material shall be replaced as necessary to make contiguous work uniform and harmonious. Work out of alignment where exposed by removal of existing work shall be called to the Contracting Officer's attention. Necessary corrective work directed by the Contracting Officer will be subject to adjustment of the contract in accordance with "Differing Site Conditions" clause of the General Conditions.

END OF SECTION 01010

SECTION 01040 - PROJECT COORDINATION

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS:

A. This Section specifies requirements for project coordination including:

1. Coordination.
2. Administrative and supervisory personnel.
3. General installation provisions.
4. Cleaning and protection.

B. Coordination: Coordinate construction and performance activities included on the delivery order, (GSA SF 300) according to the various Sections of this document to assure efficient and orderly installation of each component. Coordinate operations included under different Sections that are dependent on each other for proper installation and operation.

1. Where installation of one component depends on installation of other components before or after its own installation, schedule activities in the sequence required to obtain the best results.

2. Where space is limited, coordinate installation of different components to assure maximum accessibility for maintenance, service and repair.

3. Make provisions to accommodate items scheduled for later installation.

C. Prepare memoranda for distribution to each party involved outlining required coordination procedures. Include required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the owner and separate Contractors where coordination of their Work is required.

D. Administrative Procedures: Coordinate scheduling and timing of administrative procedures with other activities to avoid conflicts and ensure orderly progress. Such activities include:

1. Preparation of schedules.
2. Installation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Project closeout activities.

E. Coordination Drawings: Prepare Coordination Drawings where close coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space necessitates maximum utilization of space for efficient installation of different components.

1. Show relationship of components shown on separate Shop Drawings.

2. Indicate required installation sequences.

3. Refer to Division-15 Section "Basic Mechanical Requirements," and Division-16 Section "Basic Electrical Requirements" for requirements for mechanical and electrical installations.

F. Staff Names: Within 15 days of Notice to Proceed, submit a list of Contractor's staff assignments, including Superintendent and personnel at the site; identify individuals, their duties and responsibilities, addresses and telephone numbers.

G. Inspection of Conditions: The Installer of each component shall inspect the substrate and conditions under which Work is performed. Do not proceed until unsatisfactory conditions have been corrected.

H. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that they are more stringent than requirements in Contract Documents.

I. Inspect material immediately upon delivery and again prior to installation. Reject damaged and defective items.

J. Provide attachment and connection devices and methods necessary for securing each construction element. Secure each construction element true to line and level. Allow for expansion and building movement.

K. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints to obtain the best effect. Refer questionable choices to the Architect for decision.

L. Recheck measurements and dimensions, before starting installation.

M. Install each component during weather conditions and project status that will ensure the best results. Isolate each part from incompatible material as necessary to prevent deterioration.

N. Coordinate temporary enclosures with inspections and tests, to minimize uncovering completed construction for that purpose.

O. Mounting Heights: Where mounting heights are not indicated, install components at standard heights for the application indicated. Refer questionable decisions to the Architect or Contracting Officer's Representative.

P. Cleaning and Protection: During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

1. Clean and maintain completed construction as often as necessary through the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

2. Limiting Exposures: supervise operations to ensure that no part of construction, completed or in progress, is subject to harmful or deleterious exposure. Such exposures include:

a. Excessive static or dynamic loading.
b. Excessive internal or external pressures.
c. Excessive weathering.
d. Excessively high or low temperatures or humidity.
e. Air contamination or pollution.
f. Water or ice.

g. Chemicals or solvents.
h. Heavy traffic, soiling, staining and corrosion.
i. Rodent and insect infestation.
j. Unusual wear or other misuse.
k. Contact between incompatible materials.
l. Theft or vandalism.

END OF SECTION 01040

SECTION 01045 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for cutting and patching.

B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1. Requirements of this Section apply to mechanical and electrical installations. Refer to Division-15 and Division-16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

C. Demolition of selected portions of the building for alterations is included in Section 02070, Selective Demolition.

1.3 SUBMITTALS

A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.

2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
3. List products to be used and firms or entities that will perform Work.

4. Indicate dates when cutting and patching is to be performed.

5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

7. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

1.4 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load carrying capacity or load-deflection ratio.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:

a. Foundation construction.
b. Bearing and retaining walls.
c. Structural concrete.
d. Structural steel.
e. Lintels.
f. Timber and primary wood framing.
g. Structural decking.
h. Stair systems.
i. miscellaneous structural metals.
j. Exterior curtain wall construction.
k. Equipment supports.
l. Piping, ductwork, vessels and equipment.

B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:

a. Shoring, bracing, and sheeting.
b. Primary operational systems and equipment.
c. Air or smoke barriers.
d. Water, moisture, or vapor barriers.
e. Membranes and flashing.
f. Fire protection systems.
g. Noise and vibration control elements and systems.
h. Control systems.
i. Communication systems.
j. Conveying systems.
k. Electrical wiring systems.

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

1. If possible retain the original installer or fabricator to cut and patch the following categories of exposed work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm:

a. Processed concrete finishes.
b. Stonework and stone masonry.
c. Ornamental metal.
d. Matched-veneer woodwork.

e. Preformed metal panels.
f. Window wall system.
g. Stucco and ornamental plaster.
h. Acoustical ceilings.
i. Terrazzo.
j. Finished wood flooring.
k. Fluid-applied flooring.
l. Carpeting.
m. Aggregate wall coating.
n. Wall covering.
o. Swimming pool finishes.
p. HVAC enclosures, cabinets or covers.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

B. Plaster: Comply with ASTM C 842.

1. Base Coat: Ready-mixed, sand aggregate gypsum plaster base.

2. Finish Coat: Ready-mixed gypsum finish plaster.

PART 3 - EXECUTION

3.1 INSPECTION

A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

1. Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surf aces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.

1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.

4. Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.

5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.

a. Where patching occurs in a smooth painted surf ace, extend final paint coat over entire unbroken containing the patch, after the patched area has received primer and second coat.

4. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

D. Plaster Installation: Comply with manufacturer's instructions and install thickness and coats as indicated.

1. Unless otherwise indicated provide 3-coat Work.

2. Finish gypsum plaster with smooth-troweled finish. Sand lightly to remove trowel marks and arrises.

3. Cut, patch, point-up and repair plaster to accommodate other construction and to restore cracks, dents and imperfections.

3.4 CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 01045

SECTION 01090 - DEFINITIONS AND STANDARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative requirements for compliance with governing regulations, codes and standards.

1. Requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes and standards.

2. Refer to General and Supplementary Conditions for requirements for compliance with governing regulations.

1.3 DEFINITIONS

A. General: Definitions contained in this Article are not necessarily complete, but are general to the extent that they are not defined more explicitly elsewhere in the Contract Documents.

B. Indicated refers to graphic representations, notes or schedules on the Drawings, or other Paragraphs or Schedules in Specifications, and similar requirements in contract Documents. Where terms such as "shown", "noted", "scheduled" and "specified" are used, it is to help locate the reference; no limitation on location is intended except as specifically noted.

C. Directed: Terms such as "directed", "requested", "authorized", "selected", "approved", "required" and "permitted" mean "directed by the Architect", "requested by the Architect", and similar phrases. However, no implied meaning shall be interpreted to extend the Architect's responsibility into the Contractor's area of construction supervision.

D. Approve: The term "approved", where used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the responsibilities and duties of the Architect stated in General and Supplementary Conditions. Such approval shall not release the Contractor from responsibility to fulfill Contract Document requirements, unless otherwise provided in the Contract Documents.

E. Regulation: The term "Regulations" includes laws, statutes, ordinances and lawful orders issued by authorities having jurisdiction, as well as rules, conventions and agreements within the construction industry that control performance of the Work, whether they are lawfully imposed by authorities having jurisdiction or not.

F. Furnish: The term "furnish" is used to mean "supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations."

G. Install: The tern "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations."

H. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

I. Installer: An "Installer" is an entity engaged by the Contractor, either as an employee, subcontractor or subsubcontractor for performance of a particular construction activity, including installation, erection, application and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term "experienced", when used with the term "Installer" means having a minimum of 5 previous Projects similar in size and scope to this Project, and familiar with the precautions required, and has complied with requirements of the authority having jurisdiction.

J. Project Site is the space available to the Contractor for performance of the Work, either exclusively or in conjunction with others performing other construction as part of the Project. The extent of the Project Site is shown on the Drawings, and may or may not be identical with the description of the land upon which the Project is to be built.

K. Testing Laboratories: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on, and, if required, to interpret, results of those inspections or tests.

1.4 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. This Article is provided to help the user of these Specifications understand the format, language, implied requirements, and similar conventions. None of the explanations shall be interpreted to modify the substance of Contract requirements.

B. Specification Format: These Specifications are organized into Divisions, Sections or Trade Headings based on the Construction Specifications Institute's 16-Division format and the MASTERFORMAT numbering system. This organization conforms generally to recognized construction industry practice. Line items listed in Section 01010 #1, are organized to follow the MASTERFORMAT numbering system as well.

C. Specification Content: This Specification has been produced employing conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Language used in the Specifications and other Contract Documents is the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and where the full context of the Contract Documents so indicates.

2. Imperative Language is used generally in the Specifications. Requirements expressed imperatively are to be performed by the Contractor. At certain locations

in the text, for clarity, subjective language is used to describe responsibilities which must be fulfilled indirectly by the Contractor, or by others when so noted.

D. Assignment of Specialists: The Specification requires that certain specific construction activities shall be performed by specialists who are recognized experts in the operations to be performed. The specialists must be engaged for those activities, and the assignments are requirements over which the Contractor has no choice or option. Nevertheless, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.

1. This requirement shall not be interpreted to conflict with enforcement of building codes and similar regulations governing the Work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.

2. Trades: Use of titles such as "carpentry" is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradesperson of the corresponding generic name.

1.5 DRAWING SYMBOLS

A. Graphic symbols used on the Drawings are those recognized in the construction industry for purposes indicated. Where not otherwise noted, symbols are defined by "Architectural Graphic Standards", published by John Wiley & Sons, Inc., seventh edition.

B. Mechanical/Electrical Drawings: Graphic symbols used on mechanical and electrical Drawings are generally aligned with symbols recommended by ASHRAE. Where appropriate, they are supplemented by more specific symbols recommended by technical associations including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to the Architect for clarification before proceeding.

1.6 INDUSTRY STANDARDS

A. Applicability of Standards: Except where Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into Contract Documents. Such standards are made a part of the Contract Documents by reference. Individual Sections indicate which codes and standards the Contractor must keep available at the Project Site for reference.

1. Referenced standards take precedence over standards that are not referenced but recognized in the construction industry as applicable.

2. Unreferenced standards are not directly applicable to the Work, except as a general requirement of whether the Work complies with recognized construction industry standards.

3. Unreferenced Standards: Except as otherwise limited by the Contract Documents, standards not referenced but recognized in the industry as applicable will be enforced for performance of the Work. The Architect will decide whether a code or standard is applicable, or which of several are applicable.

B. Publication Dates: Where compliance with an industry standard is required, comply with standard in effect as of date of Contract Documents.

1. Updated Standards: At the request of the Architect, Contractor or authority having jurisdiction, submit a Change Order proposal where an applicable code or standard has been revised and reissued after the date of the Contract Documents and before performance of Work affected. The Architect will decide whether to issue a Change Order to proceed with the updated standard.

C. Conflicting Requirements: Where compliance with two or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the Contract Documents indicate otherwise. Refer requirements that are different, but apparently equal, and uncertainties as to which quality level is more stringent to the Architect for a decision before proceeding.

1. Minimum Quantities or Quality Levels: In every instance the quantity or quality level shown or specified shall be the minimum to be provided or performed. The actual installation may comply exactly, within specified tolerances, with the minimum quantity or quality specified, or it may exceed that minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum values, as noted, or appropriate for the context of the requirements. Refer instances of uncertainty to the Architect for decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entities' construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.

2. Although copies of standards needed for enforcement of requirements may be part of required submittals, the Architect reserves the right to require the Contractor to submit additional copies as necessary for enforcement of requirements.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations as referenced in Contract Documents are defined to mean the associated names. Names and addresses are subject to change, and are believed to be, but are not assured to be, accurate and up-to-date as of date of Contract Documents:

AA Aluminum Association
900 19th St., NW, Suite 300
Washington, DC 20006 (202) 862-5100

AABC Associated Air Balance Council
1518 K St., NW, Suite 503
Washington, DC 20005 (202) 737-0202

AAMA American Architectural
Manufacturer's Association
2700 River Rd., Suite 118
Des Plaines, IL 60018 (312) 699-7310

AASHTO American Association of State
Highway and Transportation

Officials
444 North Capitol St., Suite 225
Washington, DC 20001 (202) 624-5800

AATCC American Association of Textile Chemists and Colorists
P.O. Box 12215
Research Triangle Park, NC 27709 (919) 549-8141

ACI American Concrete Institute
P.O. Box 19150 Detroit, MI 48219 (313) 532-2600

ACIL American Council of Independent Laboratories
1725 K St., NW
Washington, DC 20006 (202) 887-5872

ACPA American Concrete Pipe Association
8320 Old Courthouse Rd.
Vienna, VA 22180 (703) 821-1990

ADC Air Diffusion Council
230 N. Michigan Ave., Suite 1200
Chicago, IL 60601 (312) 372-9800

AGA American Gas Association
1515 Wilson Blvd.
Arlington, VA 22209 (703) 841-8400

AHA American Hardboard Association
520 N. Hicks Rd.
Palatine, IL 60067 (312) 934-8800

AI Asphalt Institute
Asphalt Institute Building
College Park, MD 20740 (301) 277-4258

AIA American Institute of Architects
1735 New York Ave., NW
Washington, DC 20006 (202) 626-7300

AIHA American Industrial Hygiene Association
475 Wolf Ledges Parkway
Akron, OH 44311 (216) 762-7294

AISC American Institute of Steel Construction
400 N. Michigan Ave., 8th Floor
Chicago, Il 60611 (312) 670-2400

AISI American Iron and Steel Institute
1000 Sixteenth St., NW
Washington, DC 20036 (202) 452-7100

AITC American Institute of Timber Construction
333 W. Hampden Ave.
Englewood, CO 80110 (303) 761-3212

ALI Associated Laboratories
641 S. Vermont St.
Palatine, IL 60067 (312) 358-7400

ALSC American Lumber Standards Committee
P.O. Box 210
Germantown, MD 20874 (301) 972-1700

AMCA Air Movement and Control Association
30 W. University Drive
Arlington Heights, IL 60004 (312) 449-2933

ANSI American National Standards Institute
1430 Broadway
New York, NY 10018 (212) 354-3300

APA American Plywood Association
P.O. Box 11700
Tacoma, WA 98411 (206) 565-6600

A.P.A. American Parquet Association
1650 Union National Plaza
Little Rock, AR 72201 (501) 375-5561

API American Petroleum Institute
1220 L St.,
NW Washington, DC 20005 (202) 682-8000

ARI Air Conditioning and Refrigeration Institute
1501 Wilson Blvd.
Arlington, VA 22209 (703) 524-8800

ARMA Asphalt Roofing Manufacturers Association
6288 Montrose Rd.
Rockville, MD 20852 (301) 231-9050

ASA Acoustical Society of America
335 East 45th St.
New York, NY 10017 (516) 349-7800

ASC Adhesive and Sealant Council
1500 Wilson Blvd., Suite 515
Arlington, VA 22209 (703) 841-1112

ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329	(404) 636-8400
ASME	American Society of Mechanical Engineers 345 East 47th St. New York, NY 10017	(212) 705-7722
ASPE	American Society of Plumbing Engineers 3617 Thousand Oaks Blvd., Suite 210 Westlake, CA 91362	(805) 495-7120
ASSE	American Society of Sanitary Engineering P.O. Box 40362 Bay Village, OH 44140	(216) 835-3040
ASTM	ASTM 1916 Race St. Philadelphia, PA 19103	(215) 299-5400
AWI	Architectural Woodwork Institute 2310 S. Walter Reed Drive Arlington, VA 22206	(703) 671-9100
AWPA	American Wood Preservers' Association P.O. Box 5283 Springfield, VA 21666	(703) 339-6660
AWPB	American Wood Preservers Bureau P.O. Box 6058 2772 S. Randolph St. Arlington, VA 22206	(703) 931-8180
AWS	American Welding Society P.O. Box 351040 550 Le Jeune Road, NW Miami, FL 33135	(305) 443-9353
AWWA	American Water Works Association 6666 W. Quincy Ave. Denver, CO 80235	(303) 794-7711
BANC	Brick Association of North Carolina P.O. Box 13290 Greensboro, NC 27415	(919) 273-5566

BHMA Builders' Hardware Manufacturers Association
60 East 42nd St., Room 511
New York, NY 10165 (212) 682-8142

BIA Brick Institute of America
11490 Commerce Park Drive, Suite 300
Reston, VA 22091 (703) 620-0010

BIFMA Business and Institutional Furniture Manufacturer's Association
2335 Burton St., SE
Grand Rapids, MI 49506 (616) 243-1681

CAUS Color Association of the United States
343 Lexington Ave.
New York, NY 10016 (212) 683-9531

CAGI Compressed Air and Gas Institute
c/o Thomas Associates, Inc.
1230 Keith Building
Cleveland, OH 44115 (216) 241-7333

CBM Certified Ballast Manufacturers Association
Hanna Building, Suite 772
1422 Euclid Ave.
Cleveland, OH 44115 (216) 241-0711

CDA Copper Development Association
Box 1840 Greenwich Office Park 2
Greenwich, CT 06836 (203) 625-8210

CGA Compressed Gas Association
1235 Jefferson Davis Highway
Arlington, VA 22202 (703) 979-0900

CISPI Cast Iron Soil Pipe Institute
1499 Chain Bridge Rd., Suite 203
McLean, VA 22101 (703) 827-9177

CRI Carpet and Rug Institute
Box 2048
Dalton, GA 30720 (404) 278-3176

CRSI Concrete Reinforcing Steel Institute
933 Plum Grove Rd.
Schaumburg, IL 60195 (312) 490-1700

CTI Ceramic Tile Institute of America
700 North Virgil Ave.

	Los Angeles, CA 90029	(213) 660-1911
DHI	Door and Hardware Institute 7711 Old Springhouse Rd. McLean, VA 22102	(703) 556-3990
DLPA	Decorative Laminate Products Association 600 South Federal St., Suite 400 Chicago, IL 60605	(312) 345-1600
ECSA	Exchange Carriers Standards Association Four Century Drive, 3rd Floor Parsippany, NJ 07054	(201) 538-6111
EIA	Electronic Industries Association 2001 Eye St., NW Washington, DC 20006	(202) 457-4900
EIMA	Exterior Insulation Manufacturers Association P.O. Box 75037 Washington, DC 20013	(202) 783-6582
ETL	ETL Testing Laboratories, Inc. P.O. Box 2040 Route 11, Industrial Park Cortland, NY 13045	(607) 753-6711
FCI	Fluid Controls Institute P.O. Box 9036 Morristown, NJ 07960	(201) 829-0990
FGMA	Flat Glass Marketing Association White Lakes Professional Building 3310 Harrison Topeka, KS 66611	(913) 266-7013
FM	Factory Mutual Engineering and Research 1151 Boston-Providence Turnpike Norwood, MA 02062	(617) 762-4300
FTI	Facing Tile Institute c/o Box 8880 Canton, OH 44711	(216) 488-1211
GA	Gypsum Association 1603 Orrington Ave. Evanston, IL 60201	(312) 491-1744
HEI	Heat Exchange Institute	

c/o Thomas Associates, Inc.
1230 Keith Building
Cleveland, OH 44115 (216) 241-7333

HI Hydronics Institute
P.O. Box 218
35 Russo Place
Berkeley Heights, NJ 07922 (201) 464-8200

HMA Hardwood Manufacturers Association
805 Sterick Building
Memphis, TN 38103 (901) 525-8221

ICEA Insulated Cable Engineers
Association Inc.
P.O. Box P
South Yarmouth, MA 02664 (617) 394-4424

IEC International Electrotechnical
Commission (Available from ANSI)
655 Fifteenth St., NW, Suite 300
Washington, DC 20015 (202) 639-4090

IEEE Institute of Electrical and
Electronic Engineers
345 E. 47th St.
New York, NY 10017 (212) 705-7900

IESNA Illuminating Engineering Society of
North America
345 E. 47th St.
New York, NY 10017 (212) 705-7926

IGCC Insulating Glass Certification
Council
Route 11, Industrial Park
Cortland, NY 13045 (607) 753-6711

ILI Indiana Limestone Institute of
America
Stone City Bank Building; Suite 400
Bedford, IN 47421 (812) 275-4426

IMSA International Municipal Signal
Association
P.O. Box 539
1115 N. Main St.
Newark, NY 14513 (315) 331-2182

IRI Industrial Risk Insurers
85 Woodland St.
Hartford" CT 06102 (203) 520-7300

ISA Instrument Society of America

	P.O. Box 12277; 67 Alexander Drive Research Triangle Park, NC 27709	(919) 549-8411
LPI	Lightning Protection Institute P.O. Box 458 Harvard, IL 60033	(815) 943-7211
MBMA	Metal Building Manufacturer's Association 1230 Keith Building Cleveland, OH 44115	(216) 241-7333
MCAA	Mechanical Contractor's Association of America 5410 Grosvenor Lane; Suite 120 Bethesda, MD 20814	(301) 897-0770
MIA	Marble Institute of America 33505 State St. Farmington, MI 48024	(313) 746-5558
ML/SFA	Metal Lath/Steel Framing Association 600 South Federal St., Suite 400 Chicago, IL 60605	(312) 346-1600
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry 127 Park St., NE Vienna, VA 22180	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers 600 S. Federal St., Suite 400- Chicago, IL 60605	(312) 922-6222
NAPA	National Asphalt Pavement Association Calvert Building, Suite 620 6811 Kenilworth Ave. Riverdale, MD 20737	(301) 779-4880
NAPF	National Association of Plastic Fabricators (Now DLPA)	
NBGQA	National Building Granite Quarries Association P.O. Box 482 Barre, VT 05641	(802) 476-3115
NBHA	National Builder's Hardware Association (Now DHI)	

NCMA National Concrete Masonry Association
P.O. Box 781
Herndon, VA 22070 (703) 435-4900

NCRPM National Council on Radiation Protection and Measurement
7910 Woodmont Ave.; Suite 1016
Bethesda, MD 20814 (301) 657-2652

NEC National Electric Code (by NFPA)

NECA National Electrical Contractors Association
7315 Wisconsin Ave.
Bethesda, MD 20814 (301) 657-3110

NEII National Elevator Industry, Inc.
630 Third Ave
New York, NY 10016 (212) 986-1545

NEMA National Electrical Manufacturers Association
2101 L St., NW; Suite 300
Washington, DC 20037 (202) 457-8400

NFPA National Fire Protection Association
Batterymarch Park
Quincy, MA 02269 (617) 770-3000

N.F.P.A. National Forest Products Association
1250 Connecticut Ave. NW
Washington, DC 20036 (202) 463-2700

NHLA National Hardwood Lumber Association
P.O. Box 34518
Memphis, TN 38184 (901) 377-1818

NKCA National Kitchen Cabinet Association
P.O. Box 6830
Falls Church, VA 22046 (703) 237-7580

NLGA National Lumber Grades Authority
1460 - 1055 West Hastings St.
Vancover, British Columbia
Canada V6E 2G8

NOFMA National Oak Flooring Manufacturers Association
8 North Third St.
804 Sterick Building, Suite 804
Memphis, TN 38103 (901) 526-5016

NPA National Particleboard Association

18928 Premiere Court
Gaithersburg, MD 20879 (301) 670-0604

NPCA National Paint and Coatings Association
1500 Rhode Island Ave., NW
Washington, DC 20005 (202) 462-6272

NRCA National Roofing Contractors Association
6250 River Rd.
Rosemont, IL 60018 (312) 318-6722

NSF National Sanitation Foundation
P.O. Box 1468;
3475 Plymouth Rd.
Ann Arbor, MI 48106 (313) 769-8010

NSSEA National School Supply and Equipment Association
2020 Fourteenth St. North, Suite 400
Arlington, VA 22201 (703) 524-8819

NTMA National Terrazzo and Mosaic Association
3166 Des Plaines Ave.; Suite 132
Des Plaines, IL 60018 (312) 635-7744

NWMA National Woodwork Manufacturers Association (Now NWWDA)

NWWDA National Wood Window and Door Association (Formerly NWMA)
1400 E. Touhy Ave., #G54
Des Plaines, IL 60018 (312) 299-5200

PCI Prestressed Concrete Institute
201 N. Wells St.
Chicago, IL 60606 (312) 346-4071

PDI Plumbing and Drainage Institute (c/o Austin O. Roche, Jr.)
5342 Boulevard Pl.
Indianapolis, IN 46208 (317) 251-5298

PEI Porcelain Enamel Institute
1111 Nineteenth St.
Arlington, VA 22209 (703) 527-5257

RFCI Resilient Floor Covering Institute
966 Hungerford Drive; Suite 12-B
Rockville, MD 20805 (301) 340-8580

RIS Redwood Inspection Service

	591 Redwood Highway; Suite 3100 Mill Valley, CA 94941	(415) 381-1304
RMA	Rubber Manufacturers Association 1400 K St., NW Washington, DC 20005	(202) 682-4800
SAMA	Scientific Apparatus Makers Association 1101 Sixteenth St., NW Washington, DC 20036	(202) 223-1360
SDI	Steel Deck Institute P.O. Box 9506 Canton, OH 44711	(216) 493-7886
S.D.I.	Steel Door Institute (c/o A.P. Wherry and Associates, Inc.) 712 Lakewood Center North 14600 Detroit Ave. Cleveland, OH 44107	(216) 226-7700
SGCC	Safety Glazing Certification Council Route 11; Industrial Park Cortland, NY 13045	(607) 753-6711
SHLMA	Southern Hardwood Lumber Manufacturers Association (Now *HMA)	
SIGMA	Sealed Insulating Glass Manufacturers Association 111 E. Wacker Drive Chicago, IL 60601	(312) 644-6610
SJI	Steel Joist Institute 1205 48th St., North; Suite A Myrtle Beach, SC 29577	(803) 449-0487
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association P.O. Box 70 Merrifield, VA 22116	(703) 790-9890
SPIB	Southern Pine Inspection Bureau 4709 Scenic Highway Pensacola, FL 32504	(904) 434-2611
SPRI	Single Ply Roofing Institute The Breeden Co. 104 Wilmot Rd., Suite 201 Deerfield, IL 60015	(312) 940-8800
SSPC	Steel Structures Painting Council 4400 Fifth Ave.	

	Pittsburgh, PA 15213	(412) 578-3327
SWI	Steel Window Institute (c/o Thomas Associates, Inc.) 1230 Keith Building Cleveland, OH 44115	(216) 241-7333
TCA	Tile Council of America P.O. Box 326 Princeton, NJ 08542	(609) 921-7050
TIMA	Thermal Insulation Manufacturer's Association 7 Kirby Plaza Mt. Kisco, NY 10549	(914) 241-2284
TPI	Truss Plate Institute 583 D'Onofrio Drive; Suite 200 Madison, WI 53719	(608) 833-5900
UL	Underwriters Laboratories 333 Pfingsten Rd. Northbrook, IL 60062	(312) 272-8800
WCLIB	West Coast Lumber Inspection Bureau P.O. Box 23145 Portland, OR 97223	(503) 639-0651
WCMA	Wall Covering Manufacturers Association 66 Morris Ave. Springfield, NJ 07081	(201) 379-1100
WIC	Woodwork Institute of California P.O. Box 11428 Fresno, CA 93773	(209) 233-9035
WRI	Wire Reinforcement Institute 8361 A Greensboro Drive McLean, VA 22102	(703) 790-9790
WSC	Water Systems Council 600 S. Federal St., Suite 400 Chicago, IL 60605	(312) 922-6222
WSFI	Wood and Synthetic Flooring Institute 4415 West Harrison St.; Suite 242 C Hillside, IL 60162	(312) 449-2933
WLPDIA	Western Lath Plaster Drywall Industries Association (Formerly California Lath & Plaster Association)	

25332 Narbonne, Suite 170
Lomita, CA 90717 (213) 539-6080

WWPA Western Wood Products Association
1500 Yeon Building
Portland, OR 97204 (503) 224-3930

W.W.P.A. Woven Wire Products Association
2515 N. Nordica Ave.
Chicago, IL 60635 (312) 637-1359

F. Federal Government Agencies: Names and titles of federal government standard or Specification producing agencies are frequently abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard or Specification producing agencies of the federal government. Names and addresses are subject to change but are believed to be, but are not assured to be, accurate and up-to-date as of the date of the Contract Documents.

CE Corps of Engineers (US Department of the Army)
Chief of Engineers - Referral
Washington, DC 20314 (202) 693-6456

CFR Code of Federal Regulations
Available from the Government Printing Office
North Capitol St. between G and H Streets, NW
Washington, DC 20402 (202) 783-3238
(Material is usually first published in the Federal Register)

CPSC Consumer Product Safety Commission
1111 Eighteenth St., NW
Washington, DC 20207 (202) 634-7700

CS Commercial Standard (U.S. Department of Commerce)
Government Printing Office
Washington, DC 20402 (202) 377-2000

DOC Department of Commerce
14th Street and Constitution Ave., NW
Washington, DC 20230 (202) 377-2000

DOT Department of Transportation
400 Seventh St., SW
Washington, DC 20590 (202) 426-4000

EPA Environmental Protection Agency
401 M St., SW
Washington, DC 20460 (202) 829-3535

FAA Federal Aviation Administration (U.S. Department of Transportation)
800 Independence Ave., SW
Washington, DC 20590 (202) 426-4000

FCC Federal Communications Commission
1919 M St., NW
Washington, DC 20554 (202) 632-7000

FHA Federal Housing Administration (U.S. Department of Housing and Urban Development)
451 Seventh St., SW
Washington, DC 20201 (202) 755-5995

FS Federal Specification (General Services Administration)
Specifications Unit (WFSIS)
7th and D St., SW
Washington, DC 20406 (202) 472-2205
or 472-2140

GSA General Services Administration
F Street and 18th St., NW
Washington, DC 20405 (202) 655-4000

MIL Military Standardization Documents (U.S. Department of Defense)
Naval Publications and Forms Center
5801 Tabor Ave.
Philadelphia, PA 19120

NBS National Bureau of Standards (U.S. Department of Commerce)
Gaithersburg, MD 20234 (301) 921-1000

OSHA Occupational Safety and Health Administration (U.S. Department of Labor)
Government Printing Office
Washington, DC 20402 (202) 783-3238

PS Product Standard of NBS (U.S. Department of Commerce)
Government Printing Office
Washington, DC 20402 (202) 783-3238

REA Rural Electrification Administration (U.S. Department of Agriculture)
14th Street and Independence Ave., SW
Washington, DC 20250 (202) 382-1255

USDA U.S. Department of Agriculture
Independence Avenue between 12th and

14th St., SW
Washington, DC 20250 (202) 447-4929

USPS U.S. Postal Service
475 L'Enfant Plaza, SW
Washington, DC 20260 (202) 245-4000

1.7 GOVERNING REGULATIONS/AUTHORITIES

A. The Architect has contacted authorities having jurisdiction where necessary to obtain information necessary for the preparation of Contract Documents; that information may or may not be of significance to the Contractor. Contact authorities having jurisdiction directly for information and decisions having a bearing on the Work.

1. Copies of Correspondence: During preparation of the Contract Documents, the Architect has maintained a file containing correspondence with authorities having jurisdiction. This file is available at the Architect's office for reference. If requested, the Architect will provide copies of correspondence at cost of reproduction.

a. Attached Copies: Certain items of correspondence are believed to include information which is applicable to performance of the Work. These items have been reproduced and included in the Project Manual at the end of this Section, as follows:

B. Copies of Regulations: obtain copies of the following regulations and retain at the Project Site, available for reference by parties who have a reasonable need for such reference:

C. Trade Union Jurisdictions: The Contractor shall maintain, and require subcontractors to maintain, complete current information on jurisdictional matters, regulations and pending actions, as applicable to construction activities. The manner in which Contract Documents have been organized and subdivided is not intended to indicate of trade union or jurisdictional agreements.

1. Discuss new developments at Project meetings at the earliest feasible dates. Record relevant information and actions agreed upon.

2. Assign and subcontract construction activities, and employ tradesmen and laborers, in a manner that will not unduly risk jurisdictional disputes that could result in conflicts, delays, claims and losses.

1.8 SUBMITTALS

A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 - PRODUCTS
(Not Applicable)

PART 3 - EXECUTION

(Not Applicable)

END OF SECTION 01090

SECTION 01205 - PROCEDURES AND CONTROLS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. The types of minimum requirements for procedures and performance or control work of a general nature include but are not necessarily limited to the following categories:

1. Coordination and meetings.
2. Limitations for use of site.
3. Special reports.
4. Cleaning and protection.
5. Environmental Protection.

1.02 COORDINATION AND MEETINGS:

A. Coordination of Trades: Coordinate work of different trades so that interference between mechanical, electrical, architectural, and structural work, including existing services, will be avoided and within limits indicated the maximum practical space for operation, repair, removal, and testing of equipment is provided. Keep pipes, ducts, conduit, and the like as close as possible to ceiling slab, walls, and columns to take up a minimum amount of space. Locate pipes, ducts, and equipment so that they do not interfere with the intended use of eyebolts and other lifting devices.

B. Preconstruction Meeting: See Section, 'Safety and Health" 01546 for requirements of preconstruction safety meeting.

1.03 LIMITATIONS FOR USE OF SITE:

A. General: In addition to site utilization limitations and requirements shown on drawings, and indicated by other contract documents, administer allocation of available space equitably among entities needing access and space, so as to produce best overall efficiency in performance of total work of project. Schedule deliveries so as to minimize space and time requirements for storage of materials and equipment on site.

B. Occupancy of Premises: The premises will be occupied during performance of work during regular work hours, and may be occupied during performance of the work outside of the regular work hours, depending upon the occupying Agency, and the Agency's security requirements.

C. Parking Facilities: There will be no parking available at site during normal working hours. The Contractor and his employees shall make their own arrangements for vehicle parking. Site parking at other than normal hours shall be with the approval of the governemnt representative only. Without such approval, the contractor(s) shall understand that no parking on site is authorized.

D. Loading Dock Facilities: The Government will permit use of loading dock facilities on a first cone, first served basis and wait your turn. Parking for one Contractor vehicle will be permitted, when prior arrangements are made, in a general area not a reserved space, (see para. C, above).

E. Materials on the Site: Materials and equipment that are removed and not reused under this contract become the property of the Contractor, and salvage value shall be reflected in the bid.

F. Storage or Sale of Equipment on Site: Storage or sale of excess salvageable material on the site is not permitted. Remove from site.

G. USE OF BUILDING FACILITIES

1. Utility services of the building may be used in this work. toilet facilities are available on the site and may be used by the workman subject to the regulations of the Director of facilities.

2. Any temporary use of an existing elevator shall be arranged with the Director of Facilities of the building and subject to his control. Such use shall be of an intermittent nature. The Contractor shall provide and maintain suitable and adequate protective coverings for the elevator machinery, the hatchway, and the interior of the elevator during the period of temporary use. Loads in excess of the rated capacity of the elevator will not be permitted. The Government will bear the cost of the electric current of the operation of the elevator. On completion of the work, the Contractor shall remove the protective coverings together with any resultant dirt and debris and leave the equipment in a condition equal to that existing prior to starting work.

H. SITE SECURITY

Contractor shall abide by security restrictions and limitation indicated on individual “Building Profile Sheets” as attached to this package. In addition to these requirements, for each contractor or sub-contracted employee working, providing services, or otherwise entering any site covered under this contract, the contractor shall provide at a minimum:

1. Name of each employee
2. Each employees social security number.
3. Each employees date of birth.
4. Two “passport-size” photograph of each emploee, (head and shoulder view).
5. Background check law enforcement agency where employee resides.

The contractor shall supply personal history reports and fingerprints to the CO or COR (as directed), four weeks (minimum) prior to contract start date. The Government will review these forms and issue clearance photo identification to each suitable contract employee. Government forms will be furnished to each successful offeror.

Requirment herein stated within this section (“H”) will apply to every contract employee who wishes to enter any site covered under this contract. Contract employees without proper identification will be refused site access.

The Government expressly reserves the right to review contract employee identification any time such employee is onsite. This identification sahll be worn visibly at the left-hand shirt pocket on the outside of clothin at all times while employees are in any of the sites covered under this contract.

It is the contractor’s responsibility to cover any costs associated with acquiring necessary information under this section, (“H”).

1.04 SPECIAL REPORTS:

A. General: Except as otherwise indicated, submit special reports to the Contracting Officer within one day of occurrence requiring special report, with copy to others affected by occurrence.

B. Reporting Accidents: Refer to Section, "Safety and Health," 01546.

PART 2 - EXECUTION

2.01 GENERAL INSTALLATION PROVISIONS:

A. Installer's Inspection of Conditions: Require Installer of each major unit of work to inspect substrate to receive work, and conditions under which work will be performed, and to report (in writing to Contractor) unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

B. Manufacturer's Instructions: Where installations include manufactured products, comply with manufacturer's applicable instructions and recommendations for installation, to extent these are more explicit or more stringent than requirements indicated in contract documents.

C. Inspect each item, of materials or equipment immediately prior to installation, and reject damaged and defective items.

D. Install work during conditions of temperature, humidity, exposure, forecasted weather, and status of project completion which will ensure best possible results for each unit of work, in coordination with entire work. Isolate each unit of work from non-compatible work, as required to prevent deterioration.

E. Coordinate enclosure (closing-in) of work with required inspections and tests, so as to minimize necessity of uncovering work for that purpose.

F. Mounting Heights: Where mounting heights are not indicated, mount individual units of work at industry-recognized standard mounting heights for applications indicated. Refer questionable mounting height choices to the Contracting Officer for final decision.

2.02 CLEANING AND PROTECTION:

A. General: During handling and installation of work at project site clean and protect work in progress and adjoining work on a basis of perpetual maintenance. Apply suitable protective covering on newly installed work where reasonably required to ensure freedom from damage or deterioration at time of substantial completion; otherwise, clean and perform maintenance on newly installed work as frequently as necessarily through remainder of construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

B. Limiting Exposures of Work: To extent possible through reasonable control and protection methods, supervise performance of work in a manner and by means which will ensure that none of the work, whether completed or in progress, will be subjected to harmful, dangerous, damaging, or otherwise deleterious exposures during construction period. Such

exposures include (where applicable, but not by way of limitation) static loading, dynamic loading, internal pressures, external pressures, high or low temperatures, thermal shock, high or low humidity, air contamination or pollution, water, ice, solvents, chemicals, light, radiation, puncture, abrasion, heavy traffic, soiling, bacteria, insect infestation, combustion, electrical current, high speed operation, improper lubrication, unusual wear, misuse, incompatible interface, destructive testing, misalignment, excessive weathering, unprotected storage, improper shipping/ handling, theft and vandalism.

2.03 ENVIRONMENTAL PROTECTION:

A. Solid, Liquid, and Gaseous Contaminants: Contractor shall be responsible for the proper disposal of all solid, liquid, and gaseous contaminants in accordance with all local codes and regulations, together with the following requirements:

1. Discharge gaseous contaminants so that they will be sufficiently diluted with fresh air to reduce the toxicity to an acceptable level.

2. Liquid contaminants may, subject to local utility standards, be diluted with water to a level of quality acceptable in the local sewer system, or shall be contained in approved vessels for disposal at approved sites.

B. Disposal of Refuse: Remove refuse resulting from construction operations from the site, on a daily basis.

C. Trucking:

1. Load all trucks leaving the site with earthen materials or loose debris in a manner that will prevent dropping of materials on streets.

2. The Contractor and all subcontractors on or delivering to the site shall conform to all local regulations regarding load limits.

D. Construction Site Maintenance:

1. Store all supplies and equipment on project site so as to preclude mechanical and climatic damage. Maintain site in a neat and orderly Manner.

E. Noise Control: Comply with all applicable state and local laws, ordinances, and regulations relative to

1. noise control.

END OF SECTION 01205

SECTION 01340 - SUBMITTALS

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS:

A. The types of submittal requirements specified in this section include shop drawings, product data, samples, certificates of conformance or compliance, certified test or inspection reports, and miscellaneous work-related submittals. Individual submittal requirements are specified in applicable sections for each unit of work.

B. Definitions: Work-related submittals of this section are categorized for convenience as follows:

1. Shop drawings include specially-prepared technical data for this project, including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form, for general application to a range of similar projects.

2. Product data include standard printed information on materials, products and systems; not specially-prepared for this project, other than the designation of selections from among available choices printed therein.

3. Samples include both fabricated and unfabricated physical examples of materials, products and units of work; both as complete units and as smaller portions of units of work; either for limited visual inspection or (where indicated) for more detailed testing and analysis. Mock-ups are a special form, of samples, which are too large or otherwise inconvenient for handling in specified manner for transmittal of sample submittals.

4. Certificates of conformance or compliance are documents attesting that a product complies with a specified standard.

5. Certified test (or inspection) reports are documents attesting that a product meets a specified level of performance or quality when a prototype specimen is tested or inspected in accordance with a specified procedure, and consist of a certified statement by the product supplier or Contractor accompanied by a complete report of the inspection or test.

C. Miscellaneous submittals related directly to the work required by the delivery order includes warranties, record drawings, field measurement data, operating and maintenance materials, and similar information, devices and materials applicable to the work and not processed as shop drawings, or samples.

1.02 GENERAL SUBMITTAL REQUIREMENTS:

A. General:

1. All submittals shall be made to the Contracting Officer or to an individual designated by the Contracting Officer.

2. Only the Contracting Officer or an individual designated by the Contracting Officer, in writing can approve or disapprove submittals. Deviations and variations from the contract requirements contained in the submittal can be approved only by the Contracting Officer or an individual delegated such authority in writing by the Contracting Officer.

3. Failure on the part of the Contractor to indicate approval on submittals prior to submission to Contracting Officer will result in their being returned to the Contractor without being acted upon.

4. No delays in construction occasioned by the Contractor's failure to submit material for approval in accordance with the approved schedule will be excused.

B. Coordination and Sequencing: Coordinate preparation and processing of submittals with performance of the work so that work will not be delayed by submittals. Coordinate and sequence different categories of submittals for same work, and for interfacing units of work, so that one will not be delayed for coordination of the Contracting officer's review with another.

C. Preparation of Submittals: Provide permanent marking on each submittal to identify project, date, Contractor, subcontractor, submittal name and similar information to distinguish it from other submittals. Show Contractor's executed review and approval marking and provide space for the Contracting Officer's action marking. Package each submittal appropriately for transmittal and handling. Submittals which are received from sources other than through Contractor's office will be returned without action.

1.03 SPECIFIC-CATEGORY SUBMITTAL REQUIREMENTS:

A. General: Except as otherwise indicated in individual work sections, comply with requirements specified herein for each indicated category of submittal. Provide and process intermediate submittals, where required between initial and final, similar to initial submittals.

B. Shop Drawings: Refer to clause "Shop Drawings, Coordination Drawings, and Schedules" of the General Conditions. Provide newly-prepared information, on reproducible sheets, with graphic information at accurate scale (except as otherwise indicated), with name of preparer indicated (firm name). Show dimensions and note which are based on field measurement. Identify materials and products in the work shown. Indicate compliance with standards, and special coordination requirements. Do not allow shop drawing copies without stamp indicating approval by the Contracting Officer to be used in connection with the work.

1. Initial Submittal: One correctable translucent reproducible print and one-blue-line or black-line print; reproducible will be returned.

2. Final Submittal: 3 prints, plus 2 additional prints where required for maintenance manuals; 2 will be retained and remainder will be returned, one of which is to be marked-up and maintained by Contractor as "Record Document".

3. Final Submittal drawings may be in the form of “AutoCadd” (TM), version 14.0 format.

4. Equipment and Systems: Shop drawings for equipment and systems shall show ratings (where applicable), and how components are assembled, function together, and how they will be installed. Shop drawings, product data, certificate of

conformance or compliance, certified test or inspection reports, and other submittals for equipment, systems, and their component parts shall be coordinated and submitted as a unit. Multiple or piecemeal submissions are not acceptable except where prior approval is obtained from the Contracting Officer, in which case a list of data to be submitted later shall be included with the first submission.

5. Coordination Drawings: Prior to installation of sleeves and inserts for equipment, and/or the performance of work in spaces in which two or more trades are involved and in which the probability of interference exists as determined by either the Contractor or the Contracting Officer, submit composite coordination drawings for the work. Show the work of all involved trades in a scale not less than 1/2" = 1'-0", or larger if required by the Contracting Officer. Any work installed prior to approval of coordination drawings shall be at the Contractor's risk, and subsequent relocations required to avoid interference shall be made at no cost to the Government. In case interference develops, the Contracting Officer will decide which work shall be relocated, regardless of which was installed first.

   Submittal drawings may be in the form of “AutoCadd” (TM), version 14.0 format.

C. Product Data: Collect required data into one submittal for each unit of work or system; and mark each copy to show which choices and options are applicable to project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements. Maintain one set of product data (for each submittal) at project site, available for reference.

   1. Submittals: Do not submit product data, or allow its use on the project, until compliance with requirements of contract documents has been confirmed by Contractor. Submittal is for information and record, unless otherwise indicated. Initial submittal is final submittal unless returned by the Contracting officer, marked with an action which indicates an observed noncompliance. Submit 2 copies, plus 2 additional copies (which will be returned) where required for maintenance manuals.

      a. Provide a preliminary single-copy submittal where required (or desired by Contractor) for selection of options by the Contracting officer.

      b. Installers Copy: Do not proceed with installation of materials, products or systems until final copy of applicable product data is in possession of Installer.

D. Samples: (Refer to clause "Samples" of General Conditions.) Provide units identical with final condition of proposed materials or products for the work. Include "range" samples (not less than 3 units) where unavoidable variations must be expected, and describe or identify variations between units of each set. Provide full set of optional samples where the Contracting officer's selection is required. Submit samples only when called for by the Delivery Order.

   1. Submittal: At Contractor's option, provide preliminary submittal of a single set of samples for review and action. Otherwise, initial submittal is final submittal unless returned with action which requires resubmittal. Submit 3 sets of samples in final submittal; one set will be returned.

2. Quality Control Set: Maintain returned final set of samples at project site, in suitable condition and available for quality control comparisons.

3. Reusable Samples: Returned samples which are intended or permitted to be incorporated in the work are so indicated in the individual work sections, and must be in undamaged condition at time of use.

E. Certificates of Conformance or Compliance: Follow same procedure as for product data. Where feasible, and/or where required by other sections of specification indicate compliance with the specified standard by means of a label on the container, or on an inconspicuous place on the product.

F. Certified Test and Inspection Reports: Classify each as either "shop drawing" or "product data", depending upon whether report is uniquely prepared for project or a standard publication of workmanship control testing at point of production; process accordingly. For example: Conductivity Testing and certification reports, should be classified as product data, and labled accordingly.

1. Report shall include a description of the prototype specimen tested or inspected which is sufficiently descriptive to ensure Positive identification of the product by an inspector when delivered and/or installed.

2. The report shall be accompanied by a notarized statement from the supplier of the product certifying that the prototype is identical in all respects to the product proposed for the project.

3. Where feasible and/or where required by other sections of the specification, indicate compliance with the specified performance or quality by means of a label on the container or on an inconspicuous place on the product. The label shall refer to the test or inspection report and include the date of the report.

G. Warranties (Guarantees): In addition to copies desired for Contractor's use, furnish 2 executed copies, except furnish 2 additional (confirmed) copies where required for maintenance manuals.

H. Standards/Manufacturer's Recommendations: Where copy submittal is indicated, and except where specified integrally with "Product Data" submittal, submit 2 copies to the Contracting officer. Where workmanship at project site and elsewhere is governed by standard, furnish additional copies to fabricators, installers and others involved in performance of the work. Installation of the item will not be allowed to proceed until the information is received.

I. Closeout Submittals: Refer to individual work sections and to "closeout" section for specific requirements on submittal of closeout information, materials, tools and similar items.

1. Record Document Copies: Furnish two sets.

2. Maintenance/Operating Manuals: Furnish 2 copies.

3. Materials and Tools: Refer to individual work sections for required quantities of spare parts, extra and overrun stock, maintenance tools and devices, keys, and similar physical units to be submitted.

1.04 ACTION ON SUBMITTALS:

A. Contracting Officer's Action: Where action and return is required or requested, the Contracting Officer will review each submittal, mark with Action, and where possible return within 2 weeks of receipt. Where submittal must be held for coordination, Contractor will be so advised.

1. Final Unrestricted Release: Work may proceed, provided it complies with contract documents, when submittal is returned marked "Approved."

2. Final-But-Restricted Release: Work may proceed, provided it complies with notations and corrections on submittal and with contract documents, when submittal is returned marked "Approved as Noted."

3. Returned for Resubmittal: Do not proceed with work. Revise submittal in accordance with notations thereon, and resubmit without delay to obtain a different action marking. Do not allow submittals marked "Disapproved, Resubmit" (or unmarked submittals where a marking is required) to be used in connection with performance of the work.

4. Other Action: Where submittal is returned for other reasons, with the Contracting officer's explanation included, it will be marked "Action Not Required."

PART 2 - PRODUCTS

(Not Applicable).

PART 3 - EXECUTION

(Not Applicable).

END OF SECTION 01340

SECTION 01505 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS:

A. Definitions: Specific administrative and procedural minimum actions are specified in this section, as extensions of provisions in other contract documents. These requirements have been included for special purposes as indicated. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this section will be recognized as an indication that such temporary activity is not required for successful completion of the work and compliance with requirements of contract documents. Provisions of this section are applicable to, but not by way of limitation, utility services, construction facilities, security/protection provisions, and support facilities.

1.02 JOB CONDITIONS:

A. General: Establish and initiate use of each temporary facility at time first reasonably required for proper performance of the work. Terminate use and remove facilities at earliest reasonable time, when no longer needed or when permanent facilities have, with authorized use, replaced the need.

B. Conditions of Use: Install, operate, maintain and protect temporary facilities in a manner and at locations which will be safe, non-hazardous, sanitary and protective of persons and property, and free of deleterious effects.

C. Existing Equipment on Site: Cover equipment that is to remain in place within the area of contract operations and protect it against damage or loss. Store equipment that is removed in performance of work where directed or reuse in work as required by drawings and specifications. Equipment temporarily removed shall be protected, cleaned and replaced equal to its condition prior to starting work. Security for equipment or material that is to be reused and is removed for temporary storage shall be the sole responsibility of the Contractor.

PART 2 - PRODUCTS

2.01 TEMPORARY UTILITY SERVICES:

A. Water and Electricity: Premises are supplied with water and electrical services which may be used in this work, subject to regulations of the government agency in control. Contractor shall make his own arrangements for such services. Where non-potable water is used, mark each outlet with health hazard warning signs.

B. Temporary Power: Provide service with ground-fault circuit interrupter features, activated from each circuit of 20-amp or less rating.

2.02 TEMPORARY CONSTRUCTION FACILITIES:

A. The types of temporary construction facilities required include, but not by way of limitation, water distribution, drainage, dewatering equipment, enclosure of work, heat, ventilation, electrical power distribution, lighting, hoisting facilities, stairs, ladders, and roads. Provide facilities reasonably required to perform, construction operations properly and adequately.

B. Enclosures: When temporary enclosures are required to ensure adequate workmanship, weather protection and ambient conditions required for the work, provide fire-retardant treated lumber and plywood; provide tarpaulins with UL label and flame spread of 15 or less; provide translucent type (nylon reinforced polyethylene) where daylighting of enclosed space would be beneficial for workmanship, and reduce use of temporary lighting.

C. Electrical Facilities: Furnish and install all temporary electrical facilities, including lamps, required for construction and safety operations. Remove all such equipment when permanent connections have been completed. Where it is determined, during construction, that the temporary facilities, as installed, interfere with Government operations or other construction operations and, when notified by the Contracting Officer, relocate said facilities in an approved manner at no cost to the Government. No wire, bus or electrical equipment which is part of any of the permanent electrical systems may be used for temporary electrical service for construction operations, unless specifically approved by the Contracting Officer. Temporary connections shall be in accordance with NEC and OSHA requirements. The Contractor shall be responsible for any damage or injury to equipment, materials, or personnel caused by improperly protected temporary installations. All costs for materials and installation for temporary electrical facilities and energy for their operation shall be at the expense of the Contractor. The hours of operation, level of illumination and coverage for safety of personnel shall meet the minimum requirements of the Contracting Officer. Electrical welders used in the erection and fabrication of the building and its equipment shall be provided with an independent grounding cable connected directly to the structure on which the weld is being made rather than to adjacent conduit or piping.

2.03 SECURITY PROVISIONS:

A. General: Provide security to achieve protection from theft, personal injury and property damage. Refer to Section 01546, "Safety and Health." Provisions shall include, but not be limited to the following:

1. Permanent Fire Protection: Complete each fire protection facility at earliest reasonable date, and make ready for emergency use, and instruct personnel at site on availability and proper use.

2. Contractor shall consult with the GSA Director of Facilities for the security regulations in affect.

   Contractor shall comply with security regulations imposed by the GSA Director of Facilities and/or the Agency occupying the space where the work is to be performed including any necessary security clearances. SEE SECTION 01205, 1.03 para. H, Site Security.

3. Move furniture, office fixtures, and carpeting, where feasible, out of work area. Where not feasible, cover and otherwise properly protect and secure them.

4. Provide dustproof enclosures for protection where dirty work is performed. Dampen debris when removed to avoid dusting.

2.04 TEMPORARY SUPPORT FACILITIES:

A. Sanitary Facilities: Contractor's personnel may use toilet rooms on the premises subject to regulation and control of the Contracting Officer or his designated representatives.

PART 3 - EXECUTION

(NOT APPLICABLE)

END OF SECTION 01505

SECTION 01546 - SAFETY AND HEALTH

PART 1 - GENERAL

1.01 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

A. Code of Federal Regulations (CFR):

1. OSHA General Industry Safety and Health Standards (29 CFR 1910), Publication V2206; OSHA Construction Industry Standards (29 CFR 1926). One source of these regulations is OSHA Publication 2207, which includes a combination of both Parts 1910 and 1926 as they relate to construction safety and health. It is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington DC 20402.

2. National Emission Standards for Hazardous Air Pollutants (40 CFR, Part 61).

B. Federal Standard (Fed. Std):

1. 313A Material Safety Data Sheets, Preparation and the Submission of.

1.02 WORK COVERED BY THIS SECTION: This section is applicable to all work covered by this contract.

1.03 DEFINITION OF HAZARDOUS MATERIALS: Refer to hazardous and toxic materials/substances included in Subparts H and Z of 29 CFR 1910; and to others as additionally defined in Fed. Std. 313. Those most commonly encountered include asbestos, polychlorinated biphenyls (PCBS), explosives, and radioactive material, but may include others. The most likely products to contain asbestos are sprayed-on fireproofing, insulation, boiler lagging, and pipe covering.

1.04 QUALITY ASSURANCE:

A. Preconstruction Safety Meeting: Representatives of the Contractor shall meet with the Contracting officer and his/her representative(s) prior to the start of repair, alteration or construction activities for the purpose of reviewing the Contractor's safety and health programs and discussing implementation of all safety and health provisions pertinent to the work to be performed under the contract. The Contractor shall be prepared to discuss, in detail, the measures he/she intends to take in order to control any unsafe of unhealthy conditions associated with the work to be performed under the contract. This meeting may be held in conjunction with the preconstruction conference, if so directed by the Contracting officer. The conduct of this meeting is not contingent upon a general preconstruction meeting. The level of detail for the safety meeting is dependent upon the nature of the work and the potential inherent hazards. The Contractor's principal on-site representative(s), the general superintendent and his/her safety representative(s) shall attend this meeting.

B. Compliance With Regulations: All work, including the handling of hazardous materials or the disturbance or dismantling of structures containing hazardous materials shall comply with the applicable requirements of 29 CFR 1926/1910. Work involving the disturbance or dismantling of asbestos or asbestos containing materials; the demolition of structures containing asbestos; and/or the disposal and removal of asbestos, shall also comply with

the requirements of 40 CFR, Part 61, Subparts A and B. All work shall comply with applicable state and municipal safety and health requirements. Where there is a conflict between applicable regulations, the most stringent shall apply.

C. Contractor Responsibility: The Contractor shall assume full responsibility and liability for compliance with all applicable regulations pertaining to the health and safety of personnel during the execution of work, and shall hold the Government harmless for any action on his part or that of his employees or subcontractors, which results in illness, injury or death.

D. Inspections, Tests, and Reports: The required inspections, tests, and reports made by the Contractor, subcontractors, specially trained technicians, equipment manufacturers, and others as required, shall be at the Contractor's expense.

1.05 SUBMITTALS:

A. Accident Reporting: A copy of each accident report, which the Contractor or subcontractors submit to their insurance carriers, shall be forwarded through the Construction Engineer to the Contracting officer as soon as possible, but in no event later than seven (7) calendar days after the day the accident occurred.

B. Permit: If hazardous materials are disposed of off site, submit copies of permits from applicable, Federal, state, or municipal authorities.

C. Other Submittals: If agreed to in writing at the preconstruction safety meeting, other submittals shall be required. One such submittal which may be included is a plan of action for handling hazardous materials to contain the following:

1. Number, type, and experience of employees to be used for the work.

2. Description of how safety and health regulations and standards shall be met.

3. Type of protective equipment and work procedures to be used.

4. Emergency procedures for accidental spills or exposures.

5. Procedures for disposing of or storing the toxic/hazardous materials.

6. Identification of possible hazards, problems, and propose control mechanisms.

7. Protection of public or others not related to the operation.

8. Interfacing and control of subcontractors, if any.

9. Identifications of analysis, test demonstrations, and validation requirements.

10. Method of certification for compliance.

1.06 CAUTIONARY PROCEDURES AT EXISTING VAULTS: Vault doors in existing buildings may be equipped with protective devices having tear gas attachments. The Contractor shall consult the Building ?tanager to ascertain whether vault doors in areas under this contract are so equipped. It is unsafe for persons unfamiliar with such protective devices to tamper with or disturb them. If a vault door so equipped is to be removed, left open or reset, the Contractor

shall give the Construction Engineer or the Building Manager of the building two weeks notice to arrange for disconnecting the protective devices.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT: Special facilities, devices, equipment, clothing, and similar items used by the Contractor in the execution of work shall comply with applicable regulations.

2.02 HAZARDOUS MATERIALS: The Contractor shall bring to the attention of the Contracting Officer any material suspected of being hazardous which he encounters during execution of the work. A determination will be made by the Contracting officer as to whether the Contractor shall perform tests to determine if the material is hazardous. If the Contracting Officer directs the Contractor to perform tests, and/or if the material is found hazardous and additional protective measures are needed, a contract change may be required, subject to "Differing Site Conditions" clause of the General Conditions.

PART 3 - EXECUTION

3.01 STOP WORK ORDERS: When the Contractor or his/her subcontractors are notified by the Contracting Officer's Representative(s) of any noncompliance with the provisions of the contract and the action(s) to be taken, the Contractor shall immediately, if so directed, or within 48 hours after receipt of a notice of violation correct the unsafe or unhealthy condition. If the Contractor fails to comply promptly, all or any part of the work being performed may be stopped by the Contracting Officer or his/her representative(s) with a "Stop Work Order.' When, in the opinion of the Contracting Officer or his/her representative(s), satisfactory corrective action has been taken to correct the unsafe and unhealthy condition, a start order will be given immediately. The Contractor shall not be allowed any extension of time or compensation for damages by reason of or in connection with such work stoppage.

3.02 PROTECTION:

A. The Contractor shall take all necessary precautions to prevent injury to the public, building occupants, or damage to property of others. For the purposes of this contract, the public or building occupants shall include all persons not employed by the Contractor or a subcontractor working under his/her direction.

B. Work shall not be performed in any area occupied by the public or Federal employees unless specifically permitted by the contract or the Contracting officer and unless adequate steps are taken for the protection of the public or Federal employees.

C. Whenever practicable, the work area shall be fenced, barricaded, or otherwise blocked off from the public or building occupants to prevent unauthorized entry into the work area.

D. Alternate Precautions: When-the nature of the work prevents isolation of the work area and the public or building occupants may be in or pass through, under or over the work area, alternate precautions such as the posting of signs, the use of signal persons, the erection of barricades or similar protection around particularly hazardous operations shall be used as appropriate.

E. Public Thoroughfare: When work is to be performed over a public thoroughfare such as a sidewalk, lobby, or corridor, the thoroughfare shall be closed, if possible, or other

precautions taken such as the installation of screens or barricades. When the exposure to heavy falling objects exists, as during the erection of the building wall or during demolition, special protection of the type detailed in 29 CFR 1910/1926 shall be provided.

F. Fences and barricades shall be moved upon completion of the project, in accordance with local ordinance and to the satisfaction of the Contracting officer or his/her representative(s).

G. Storing, positioning or use of equipment, tools, materials, scraps, and trash in a manner likely to present a hazard to the public or building occupants by its accidental shifting, ignition, or other hazardous qualities is prohibited.

H. Obstructions: No corridor, aisle, stairway, door, or exit hall be obstructed or used in such a manner as to encroach upon routes of ingress or egress utilized by the public or building occupant, or to present unsafe or unhealthy condition to the public or building occupant.

END OF SECTION 01546

SECTION 01605 - PRODUCTS

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS:

A. General: Refer to clause, "Materials and Workmanship," of the, General Conditions. Unless otherwise specifically provided in this contract, reference to any equipment, material, article, or patented process, by trade name, make, or catalog number", shall be regarded as establishing a standard of quality and shall not be construed as limiting competition, and the contractor may, at his option, use any equipment, material, article, or process, which, in the judgement of the Contracting Officer, is equal to that named.

B. Definitions: "Products" is defined to include purchased items for incorporation into the work, regardless of whether specifically purchased for project or taken from Contractor's stock of previously purchased products. "Materials", is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined or otherwise fabricated, processed, installed or applied to form units of work. "Equipment" is defined as products with operational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, etc.). Definitions in this paragraph are not intended to negate the meaning of other terms used in contract documents, including "specialties", "systems", "structure", "finishes", "accessories", "furnishings", "special construction", and similar terns, which are self-explanatory and have recognized meanings in the construction industry.

C. Standards: Refer to Division-1 section "Definitions and Standards" for applicability of industry standards to products of project, and for acronyms used in text of specification sections.

1.02 QUALITY ASSURANCE:

A. Source Limitations: To the greatest extent possible for each unit of work, and subject to the restrictions of the Buy American Act, provide products, materials or equipment of a singular generic kind from a single source.

B. Compatibility of Options: Where more than one choice is available as options for Contractor's selection of a product or material, select an option which is compatible with other products and materials already selected (which may have been from among options for those other products and materials). Total compatibility among options is not assured by limitations within contract documents, but must be provided by Contractor. Compatibility is a basic general requirement of product/material selections.

1.03 SUBMITTALS:

A. Requests for Substitutions: Requests for substitution shall be treated as a contract change and shall be subject to clauses "Changes" and "Equitable Adjustments" in General Conditions. Submit 3 copies, fully identified for product or method being replaced by substitution, including related specification section and drawing number(s), and fully documented to show compliance with requirements for substitutions. Include product data/drawings, description of methods, samples where applicable, Contractor's detailed comparison of significant qualities between specified item and proposed substitution, statement of effect on construction time and coordination with other affected work, cost

information or proposal, and Contractor's statement to the effect that proposed substitution will result in overall work equal-to-or-better-than work originally indicated.

B. Labels and Listings: Where equipment or materials are specified to conform to requirements of the standards of organizations such as American Society of Mechanical Engineers (ASME), Underwriters Laboratories, Inc. (UL), American Gas Association (AGA), American Refrigeration Institute (ARI), Air Diffusion Council (ADC), Sheet Metal and Air-Conditioning Contractors National Association, Inc. (SMACNA), and Air Moving and Conditioning Association (AMCA), that use a label or listing as a method of indicating compliance, proof of such conformance shall be submitted to the Contracting Officer for approval.

1. The label or listing of the specified organization will be acceptable evidence. In lieu of the label or listing, the Contractor may submit a notarized certificate from a nationally recognized testing organization, adequately equipped and competent to perform such services and approved by the Contracting Officer, stating that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard or code. For materials whose compliance with organizational standards or specifications is not regulated by an organization using its own listing or label as proof of compliance, a notarized certificate from the manufacturer shall be furnished to the Contracting Officer stating that the material complies with the applicable referenced standard or specification.

C. Work Related Submittals: Contractor's submittal of (and Architect's/Engineer's acceptance of) shop drawings, product data or samples which relate to work not complying with requirements of contract documents, does not constitute an acceptable or valid request for a substitution, nor approval thereof.

1.04 PRODUCT DELIVERY-STORAGE-HANDLING:

A. General: Deliver, handle and store products in accordance with Manufacturer's recommendations and by methods and means which will prevent damage, deterioration, and loss including theft and protect against damage from climatic conditions. Control delivery schedules to minimize long-term storage of products at site and overcrowding of construction spaces. In particular, provide delivery/installation coordination to ensure minimum holding or storage times for products recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other sources of loss. Damaged or defective items, in the opinion of the Contracting Officer shall be replaced at no cost to the Government.

1.05 WARRANTIES (GUARANTEES):

A. General: The warranty and guarantee provisions of the General Conditions apply to all work of the contract, including but not limited to, the following specific categories related to individual units of work specified in sections of Divisions 2 through 16 of these specifications:

1. Specified Product Warranty: A warranty which is required by contract documents, to be provided for a manufactured product incorporated into the work; regardless of whether manufacturer has published a similar warranty without regard for specific incorporation of product into the work, or has written and executed a special project warranty as a direct result of contract document requirements.

2. Coincidental Product Warranty: A warranty which is not specifically required by contract documents (other than as specified in this Section); but which is available on a product incorporated into the work, by virtue of the fact that manufacturer of product has published warranty in connection with purchases and uses of product without regard for specific applications except as otherwise limited by terms of warranty.

B. **Refer to individual sections of Divisions 2 through 16** for the determination of units of work which are required to be specifically or individually warranted, and for the specific requirements and terms of those warranties (or guarantees), in excess of what the General Conditions require.

PART 2 - PRODUCTS

2. 01 GENERAL PRODUCT COMPLIANCES:

A. General: The compliance requirements, for individual products as indicated in contract documents, are multiple in nature and may include generic, descriptive, performance, prescriptive, compliance with standards, conformance with graphic details and other similar forms and methods of indicating requirements, all of which must be complied with.

B. Procedures for Selecting Products: Contractor's options for selecting products are limited by contract document requirements, and governing regulations, and are not controlled by industry traditions or procedures experienced by Contractor on previous construction projects. Required procedures include, but are not necessarily limited to, the following for various indicated methods of specifying:

1. Standards, Codes and Regulations: Where only compliance with an imposed standard, code or regulation is required, selection from among products which comply with requirements including those standards, codes and regulations, is Contractor's option.

2. Performance Requirements: Provide products which comply with specific performances indicated, and which are recommended by manufacturer (in published product literature or by individual certification) for application indicated. Overall performance of a product is implied where product is specified with only certain specific performance requirements.

3. Prescriptive Requirements: Provide products which have been produced in accordance with prescriptive requirements, using specified ingredients and components, and complying with specified requirements for mixing, fabricating, curing, finishing, testing and similar operations in manufacturing process.

4. Visual Matching: Where matching with an established sample is required, final judgement of whether a product proposed by Contractor matches sample satisfactorily is the Contracting Officer's.

5. Visual Selection: Except as otherwise indicated, where specified product requirements include " ... as selected from manufacturer's standard colors, patterns, textures..." or words of similar effect, the selection of manufacturer and

basic product (complying with requirements) is Contractor's option, and subsequent selection of color, pattern and texture is the Contracting Officer's selection.

C. General Requirements for Electrical Work: The following applies to electrical work unless other-wise specified:

1. Comply with NEC.

2. Conduits, Wiring and Equipment: Arrange generally as indicated. Any change resulting in a savings in labor or materials shall be made only in accordance with a contract change order. Deviations shall be made only where necessary to avoid interferences and only after drawings showing the proposed deviations have been submitted to and approved by the Contracting Officer.

3. Ratings. The motor horsepowers and apparatus wattage ratings shown or specified are estimated values, and the corresponding sizes of feeders and other electrical equipment indicated to serve them are minimum sizes. Motors of greater horsepower and apparatus with larger wattage ratings may be furnished if necessary to meet the requirements of the various sections of the specification in which they are specified. Where larger motors or apparatus with larger wattage ratings are furnished, the feeders and other electrical equipment serving them shall be increased in capacity to correspond. The increase in the capacity of the feeder and other apparatus shall be furnished at no additional cost to the Government in each case in which the Contracting Officer determines that apparatus meeting the specification requirements and requiring a horsepower or wattage not exceeding that listed is available from two or more sources.

2.02 GENERAL PROJECT REQUIREMENTS:

A. General: Provide products which comply with the clause "MATERIALS AND WORKMANSHIP" of the General Conditions, and which are undamaged and unused at time of installation, and which are complete with accessories, trim, finish, safety guards and other devices and details needed for complete installation and for intended use and effect.

1. Standard Products: Products shall be essentially the standard catalogued products of manufacturers regularly engaged in production of such products and shall be the manufacturer's latest standard design that complies with the specification requirements.

Equipment shall essentially duplicate items that have been in satisfactory commercial and industrial use at least two years, or more if otherwise specified, prior to bid opening; or in lieu thereof shall have been used and operated in a test installation which, in the opinion of the Contracting Officer, duplicate its field performance for the same period of tire. The Contracting Officer reserves the right to require the Contractor to submit evidence to this effect for his approval. When two units of the same class of equipment are required, these units shall be the product of a single manufacturer; however the component parts of the system need not be the products of the same manufacturer.

2. Continued Availability: Products which, by nature of their application, are likely to be needed at a later date for maintenance and repair or replacement work, shall be current models for which replacement parts are available.

2.03 LABELS AND NAMEPLATES:

A. General: To the extent feasible and consistent with the following requirements pertaining to the appearance of the finished building, wherever a product is required to comply with a specified standard, grade, class, or type, a permanent label to this effect shall be applied to the product. Where this is not feasible because of the nature of the product, the label shall be on or inside of each container.

B. Nameplates: Except as otherwise indicated for required approval labels, and operating data, do not permanently attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view either in occupied spaces or on exterior of the work.

C. Labels: Locate required labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface which, in occupied spaces, is not conspicuous.

D. Equipment Nameplates: Provide permanent nameplate on each item of service-connected or power operated equipment. Indicate manufacturer, product name, model number, serial number, capacity, speed, ratings and similar essential operating data. Locate nameplates on an easily accessed surface which, in occupied spaces, is not conspicuous.

PART 3 - EXECUTION

(Not Applicable)

END OF SECTION 01605

SECTION 01705 - PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS:

A. Definitions: Closeout is hereby defined to include general requirements near end of Contract Time, in preparation for final acceptance, final payment, normal termination of contract, occupancy and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in sections of Division 2 through 16. Time of closeout is directly related to "Substantial Completion", and therefore may be either a single time period for entire work or a series of time periods for individual parts of the work which have been noted as substantially complete at different dates. That time variation (if any) shall be applicable to other provisions of this section.

1.02 PREREQUISITES TO FINAL ACCEPTANCE:

A. General: Prior to requesting final inspection for certification of final acceptance and final payment, as required by General Provisions and Conditions, complete the following and list known exceptions (if any) in request:

1. Submit final payment request with final releases and supporting documentation not previously submitted and accepted.

2. Submit copy of final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance.

3. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents.

4. Submit record drawings, two copies. (Submittals may conform to “AutoCadd”™ 12.0 format.)

5. Deliver tools, spare parts, extra stocks of materials, and similar physical items to Government.

6. Make final change-over of locks and transmit keys to the Contracting Officer and advise Government personnel of changeover in security provisions.

7. Complete final cleaning up requirements, including touch-up painting of marred surfaces.

8. Touch-up and otherwise repair and restore marred exposed finishes.

B. Reinspection Procedure: Upon receipt of Contractor's notice that the work has been completed, including punch-list items resulting from earlier inspections, and excepting incomplete items delayed because of acceptable circumstances, the Contracting Officer will reinspect the work. Upon completion of reinspection, the Contracting Officer will either prepare certificate of final acceptance or advise contractor of work not completed or

obligations not fulfilled as required for final acceptance. If necessary, procedure will be repeated.

1.03 RECORD DOCUMENT SUBMITTALS:

A. General: As work progresses, prepare and maintain record documents as specified herein. Each record shall be certified by the Contractor and the Construction Engineer. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location accessible to the Contracting Officer for reference during normal working hours. Upon completion, turn record documents over to the Contracting Officer.

B. Record Drawings: Maintain two white-print sets (blue-line or black-line) of contract drawings (including amendment and change order drawings) and shop drawings in clean, undamaged condition with mark-up of actual installations which vary from the work as originally shown. Mark whichever drawing is most capable of showing "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at corresponding location on working drawings. Mark with red erasable pencil and, where feasible, use other colors to distinguish between variations in separate categories of work. Mark-up new information which is recognized to be of importance, but was for some reason not shown on either contract drawings or shop drawings.

Give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change order numbers where applicable. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on cover of each set.

C. Record Specifications: Maintain two copies of specifications, including amendments, change orders and similar modifications issued in printed form during construction, and mark-up variations in actual work in comparison with text of specifications and modifications as issued. Give particular attention to substitutions, selection of options, and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data, where applicable.

D. Record Product Data, Certifications and Laboratory Test Reports: Maintain two copies of each product data submittal, product certification, and laboratory test report and mark-up significant variations in actual work in comparison with submitted information. Include both variations in product as delivered to site, and variations from manufacturer's instructions and recommendations for installation. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned at a later date by direct observation. Note related change orders and mark-up of record drawings and specifications.

E. Record Sample Submittal: Immediately prior to date(s) of substantial completion, the Contracting Officer or his designated representative will meet with Contractor at site, and will determine which (if any) of submitted samples maintained by Contractor during progress of the work are to be retained by the Government. Comply with the Contracting Officer's instructions for packaging, identification marking, and delivery.

F. Miscellaneous Record Submittals: Refer to other sections of these specifications for requirements of miscellaneous record-keeping and submittals in connection with actual

performance of the work. Immediately prior to date(s) of substantial completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Turn over to the Contracting Officer prior to final acceptance.

1.04 OPERATION AND MAINTENANCE MANUALS:

A. General: When required by the Delivery Order, provide operation and maintenance manuals for each mechanical and electrical system (except as otherwise specified), for each piece of equipment, and for other systems and components specified in the technical sections of the specification. Organize manuals into suitable volumes of manageable size, as approved by the Contracting Officer. Manuals shall have table of contents, and be assembled to conform, to table of contents with tab sheets covering each subject. The instructions shall be legible and easy to read. Manuals shall be hard bound and sheets consistent in size; where oversize drawings are necessary they shall be folded in. The words "Operation and Maintenance Manual," the name and location of the building, and contract number shall appear on the cover.

B. Contents: Manuals shall include, but not be limited to, the following data:

1. Detailed description of each system and each of its components, including layout showing piping, valves, controls and other components, and including diagrams and illustrations where applicable.

2. Wiring and control diagrams with data to explain detailed operation and control of each component.

3. Control sequence describing start-up, operation, and shutdown.

4. Procedure for starting.

5. Procedure for operating.

6. Shut-down instructions.

7. Installation instructions.

8. Maintenance and overhaul instructions.

9. Lubricating schedule, including type, grade, temperature range and frequency.

10. Emergency instructions and safety precautions.

11. Corrected shop drawings.

12. Approved product data.

13. Copies of approved certifications and laboratory test reports (where applicable).

14. Copies of warranties.

15. Test procedures.

16. Performance curves and rating data.

17. Parts list, including source of supply, recommended spare parts, and service organization convenient to building site.

18. Name, address, and telephone number of each subcontractor who installed equipment and systems, and local representative for each type of equipment and each system,.

19. Other pertinent data applicable to the operation and maintenance of particular systems or equipment and/or other data specified in technical sections of the specification.

C. Submittal: Provide Contracting Officer with one copy of manual prior to the time that system or equipment tests are performed, and five additional copies 90 days before start of operation by the Government or any instruction period specified.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.01 FINAL CLEANING:

A. Comply with manufacturer's instructions for cleaning operation. The following is required in addition to special cleaning specified in technical sections.

1. Remove labels which are not required as permanent labels.

2. Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances which are noticeable as vision-obscuring materials. Replace broken glass and damaged transparent materials.

3. Clean exposed exterior and interior hard-surfaced finishes, to a dirt-free condition, free of dust, stains, films and similar noticeable distracting substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.

4. Wipe surfaces of equipment clean. Remove excess lubrication and other substances,

5. Remove debris and surface dust form limited-access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.

6. Clean concrete floors in non-occupied spaces broom clean.

7. Vacuum clean carpeted surfaces and similar soft surfaces.

8. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.

9. Clean food service equipment, if present, to a condition of sanitation ready and acceptable for intended food service use.

10. Clean light fixtures and lamps so as to function with full efficiency.

B. Removal of Protection: Except as otherwise indicated or requested by the Contracting Officer, remove temporary protection devices and facilities which were installed during course of the work to protect previously completed work during remainder of construction period.

END OF SECTION 01705

SECTION 02070 - SELECTIVE DEMOLITION

A. Extent of selective demolition work is indicated on Delivery Order.

B. Types of Selective Demolition Work: Demolition requires the selective removal and subsequent offsite disposal **(unless otherwise indicated)** of the following:

1. Portions of building structure indicated on Delivery Order and as required to accommodate new construction.

2. Removal of interior partitions as indicated on Delivery Order.

3. Removal of doors and frames indicated "remove".

4. Removal of built-in casework indicated "remove".

5. Removal of existing windows indicated to be bricked in.

6. Removal and protection of existing fixtures and equipment items indicated "salvage".

C. Related work specified elsewhere:

1. Remodeling construction work and patching is included within the respective sections of specifications, including removal of materials for re-use and incorporated into remodeling or new construction.

2. Relocation of pipes, conduits, ducts, other mechanical and electrical work are specified by respective trades.

D. Schedule: Submit schedule indicating proposed sequence of operations for selective demolition work to Contracting Officer for review prior to commencement of work. Include coordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control.

1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Government's Full-Occupancy.

E. Occupancy: Government will be continuously occupying areas of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Government's normal operations. Provide minimum of 72 hours advance notice to Contracting Officer which will impact Government's normal operations.

F. Condition of Structures: Government assumes no responsibility for actual condition of items or structures to be demolished.

1. Conditions existing at time of commencement of contract will be maintained by Government insofar as practicable. However, variations within structure may occur by Government's removal and salvage operations prior to start of selective demolition work.

G. Partial Demolition and Removal: Items indicated to be removed but of salvable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.

1. Storage or sale of removed items on site will not be permitted.

H. Protections: Provide temporary barricades and other forms of protection as required to protect Government's personnel and general public from injury due to selective demolition work.

1. Provide protective measures as required to provide free and safe passage of Government's personnel and general public to and from occupied portions of building.

2. Erect temporary covered passageways as required by authorities having jurisdiction.

3. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.

4. Protect floors with suitable coverings when necessary.

5. Construct temporary insulated solid dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks if required.

6. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces, and installation of new construction to insure that no water leakage or damage occurs to structure or interior areas of existing building.

7. Remove protections at completion of work.

I. Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to Government.

J. Traffic: Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

K. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.

1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Contracting Officer.

L. Environmental Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with contract specifications pertaining to environmental protection.

1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

M. Inspection: Prior to commencement of selective demolition work, inspect areas in which work will be performed. Photograph existing conditions to structure surfaces, equipment or to surrounding properties which could be misconstrued as damage resulting from selective demolition work; file with Contracting Officer prior to starting work.

N. Preparation: Provide interior and exterior shoring, bracing, or support to prevent movement, settlement or collapse of structures to be demolished and adjacent facilities to remain.

1. Cease operations and notify Contracting Officer immediately if safety of structure appears to be endangered. Take precautions to support structure until determinations is made for continuing operations.

O. Cover and protect furniture, equipment and fixtures to remain from soiling or damage when demolition work is performed in rooms or areas from which such items have not been removed.

P. Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.

1. Where selective demolition occurs immediately adjacent to occupied portions of the building, construct dust-proof partitions of minimum 4" studs, 5/8" drywall (joints taped) on occupied side, 1/2" fire-retardant plywood on demolition side, and fill partition cavity with sound-deadening insulation.

2. Provide weatherproof closures for exterior openings resulting from demolition work.

Q. Locate, identify, stub off and disconnect utility services that are not indicated to remain.

1. Provide by-pass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Contracting Officer if shut-down of service is necessary during change-over.

R. Demolition: Perform selective demolition work in a systematic manner.

1. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.

2. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors or framing.

3. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

4. Demolish foundation walls to a depth of not less than 12" below existing ground surface. Demolish and remove below-grade wood or metal construction. Break up below-grade concrete slabs.

5. For interior slabs on grade, use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.

6. Completely fill below-grade areas and voids resulting from demolition work. Provide fill consisting of approved earth, gravel or sand, free of trash and debris, stones over 6" diameter, roots or other organic matter.

S. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of conflict. Submit report to Contracting Officer in written, accurate detail. Pending receipt of directive from Contracting Officer rearrange selective demolition schedule as necessary to continue overall job progress without delay.

T. Salvage Items: Where indicated on Delivery Order as "Government Reserved Item", carefully remove indicated items, clean, store and turn over to Government and obtain receipt.

U. Disposal of Demolished Materials: Remove debris, rubbish and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.

1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.

2. Burning of removed materials is not permitted on project site.

V. Clean-Up and Repair: Upon completion of demolition work, remove tools, equipment and demolished materials from site. Remove protections and leave interior areas broom clean.

W. Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 02070

SECTION 02085 - ASBESTOS ABATEMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

A. This section includes removal, containment, and disposal of asbestos-containing materials. It also includes all work necessary to reduce air concentrations of asbestos to the specified level and maintain the specified asbestos control limits during the life of the contract. It also includes

1. Work Area: The work area includes the following: All areas necessary to perform the demolition and new work indicated on the drawings.
2. The following asbestos-containing materials are to be removed:

a. All asbestos faced insulated panels on the exterior face of the penthouses to be removed. Asbestos faced insulated panels are an EPA Category II, non-friable asbestos containing material (ACM.)

3. All asbestos containing materials encountered which could potentially constitute a hazard to personnel involved in performance of demolition and new construction work, unless in the opinion of the Contracting Officer, the substance is impractical to remove. In such instances, the non-removable hazard shall be encapsulated.

B. RELATED SECTIONS: The following sections contain requirements that relate to this section:

1. Demolition of adjacent materials is specified in Division 2 Section "Selective Demolition."

1.3 QUALITY ASSURANCE

A. Contractor Qualifications: The Contractor shall be a firm of established reputation whose personnel are trained in asbestos abatement, and have performed similar work on previous projects.

B. Laboratory Qualifications: Laboratory shall be regularly engaged in asbestos testing, and personnel used for monitoring airborne concentrations of asbestos fibers shall be proficient in this field.

C. Asbestos Control Limits:

1. PEL (permissible Exposure Limit) = .2 f/cc 8 hr TWA
2. Action Level =. 1 f/cc 8 hr TWA
3. Excursion Level = 1.0 f/cc 30 min. TWA

1.4 REFERENCES

A. American National Standards Institute (ANSI) Publication:

Z9.2-79 Fundamentals Governing the Design and Operation of Local Exhaust Systems

B. American Society for Testing and Materials (ASTM) Publication:

E 849-82 Safety and Health Requirements relating to Occupational Exposure to Asbestos

C. Code of Federal Regulations (CFR):

29 CFR 1910.1001; Occupational Safety and Health Act (OSHA)

29 CFR 1910.20, Subpart C, General Safety and Health Provisions

29 CFR 1910.134 OSHA Respirator Requirement

29 CFR 1926.58 Asbestos Standard for Construction

34 CFR, Parts 230 and 231, Appendix B and C, Procedures for Containing and Removing Building Materials Containing Asbestos: Federal Register, Volume 45, No. 182, Page 61961, September 17, 1980

40 CFR 61, Subparts A, B and M: U.S. Environmental Protection Agency Regulations for Asbestos

40 CFR 260-265: U.S. Environmental Protection Agency Regulations implementing the Resource Conservation and Recovery Act

D. State and Local Regulations: The Contractor shall conform to all State and local regulations. If there is a conflict between regulations (Federal, State or local), the most stringent requirement shall apply.

1.5 SUBMITTALS: Submit prior to beginning work. Do not commence work until the following has been approved.

A. Plan of Action: Submit a detailed plan of the procedures proposed for use in complying with the regulations included in this specification. The plan shall include the sequencing of asbestos work, methods to be used to assure the safety of building occupants and visitors to the site, disposal plan including location and route maps to an approved disposal site, and a detailed description of the methods to be employed to control pollution. Expand upon closing out of the building's HVAC system, method of removal to prohibit visible emissions in work area, and packaging of removed asbestos debris.
The plan must be approved by the Contracting Officer prior to the commencement of work.

B. Contractor Qualification Information: Approval by the Contracting Officer is required of the following submittals, which shall be submitted immediately after award of contract.

1. SUPERVISOR: The supervisor shall be a Competent person. A Competent person for Supervising Class II asbestos work shall be trained in all aspects of asbestos removal. Such training shall be obtained in a comprehensive course for supervisors, such a~ a course conducted by an EPA or state-approved training provider certified by the EPA; or a State or agency course equivalent in stringency, content and length. Accredited Supervisor/Designer EPA training 8 HRS.

2. EMPLOYEES: For employers whose Class II work with asbestos-containing material involves only the removal and/or the disturbance of one generic category of building material: such as non-friable panels, such employer is required to train

employees who perform such work by providing a training course which includes, as a minimum, all the elements in (a-j) listed below and the specific work practices and engineering controls as stated in (3.3 A-I) below. Such course shall include "hands on" training and shall take at least 8 hours. This training shall be conducted in a manner that the employee is able to understand.

a. Methods of recognizing asbestos.
b. The health effect associated with asbestos exposure.
c. The relationship between smoking and asbestos exposure.
d. The nature of operations that could result in exposure to asbestos, the importance of necessary protective controls to minimize exposure including, as applicable, engineering controls, work practices, respirators, housekeeping procedures, hygiene facilities, protective clothing, decontamination procedures, emergency procedures, and waste disposal procedures and any necessary instruction in the use of these controls and procedures.
e. The purpose, proper use, fitting instructions, and limitations of respirators as required by 29 CFR 1910.134.
f. The appropriate work practices for performing the asbestos job. g. Medical surveillance program requirements. h. The content of this standard, including appendices.
i. The names, addresses and phone numbers of public health organizations which provide information, materials and/or conduct programs concerning smoking cessation.
j. The requirements of posting signs and affixing labels and the meaning of the required legends for such signs and labels.

C. Certificates and Licenses:

1. If the State or municipality in which the work is to take place requires a certification or license, provide copy.

D. Laboratory Qualification Information:

1. Submit proof of qualifications of testing laboratory and personnel. Accreditation by the American Industrial Hygiene Association (AIHA) for asbestos work; and certification that persons counting the samples have been judged proficient by successful participation in the National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing (PAT) Program, shall be considered sufficient proof of compliance. Submittal must be approved by the Contracting Officer prior to beginning any testing.
2. Testing laboratory shall be a firm separate from the abatement contractor. Use of abatement contractor personnel to conduct ak sampling and monitoring work will not be acceptable.

E. Certificates of Compliance: Submit certification that vacuums, ventilation equipment and other equipment required to contain airborne asbestos fibers conform to ANSI Z9.2. Include respirator data.

1.6 CONTRACTOR RESPONSIBILITY

A. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State and local regulations pertaining to the protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State and local regulations, and shall hold

the government harmless for failure to comply with any applicable safety or health regulation on the part of himself, his employees, or his subcontractors.

B. Daily Log:

1. Contractor shall maintain on site, a Daily Log which shall include, as a minimum, the following:

a. Project name.
b. Project address.
c. Date.
d. Supervisor's name.
e. Work summary including the square footage of previous removal, square footage of this days removal and man hours worked.
f. Daily check list of functions, manpower procedures, safety items and paper work to be on file.
g. Dally Disposal Data.
h. Daily Sample Data.
i. Worker documentation including records of physicals, fit testing and training certificates.
j. Comments.

2. Submit sample of Contractor's standard Daily Log form for approval.
3. Include copies of all Daily Log forms in the Close Out Submittal.

1.7 PROJECT/SITE CONDITIONS

A. Use of Existing Facilities:

1. The Contractor shall have access to the building roof and the interior of the penthouses only.
2. The Contractor's employees shall not be permitted in the building interior.
3. The government will supply water and electricity for use by the Contractor. The Contractor shall be responsible to make all temporary utility connections and maintain same throughout the duration of the abatement. Contractor shall remove utility connections when finished.

B. Maintenance of Existing Equipment: The Contractor shall assure that all building services to occupied areas are maintained during normal business hours. Work in areas where equipment shutdown would affect environmental conditions in occupied spaces shall be performed at night and on weekends.

C. Access to Work Area: Access to roof will be by ladders on the building exterior only. No access from the building interior to the roof will be permitted.

1. The Contracting Officer and his Representative.
2. The Director of Facilities.
3. Workman on an emergency basis.
4. OSHA and EPA inspectors.
5. Local building or health inspectors.

1.8 SEQUENCING/SCHEDULING: Coordinate sequencing and scheduling of work through the Contracting Officer and/or his designated representative.

PART2 - PRODUCTS

2.1 EQUIPMENT: Equipment, including protective clothing and respirators, used in the execution of this contract and provided to visitors to the site, shall comply with ASTM E 849 and with the applicable Federal, State and local regulations. Respirators shall conform to the OSHA requirements in 29 CFR 1910.134. Use supplied air, Type "C", units during actual removal operations.

PART3 - EXECUTION

3.1 WORK PROCEDURE

A. General Procedures: Perform all asbestos related work and comply with the general safety and health provisions in conformance with 29 CFR 1910.1001 and 29 CFR 1910.20, respectively. For asbestos abatement work, use general work practices, and work practices for removal, as specified in 34 CFR Parts 230 and 231, Appendix B, ASTM E 849, and other appropriate work procedures approved by the Environmental Protection Agency (EPA).

3.2 PREPARATION

A. Remove interior wall surfaces, vapor barriers and insulation from stud walls to completely expose the interior surface of the asbestos faced insulated panels.

B. Insolate the interior of the Penthouse from the work area by installing plastic sheeting on all wall surfaces. Seal laps, seams and the entire perimeter at the top and bottom with tape to form an air tight enclosure.

C. Post warning signs and labels as required by 29 CFR 1910.1001, ASTM E 849, and as directed by the Contracting Officer.

3.3 REMOVAL OF ASBESTOS FACED INSULATED PANELS

A. Removal of asbestos faced insulated panels is considered CLASS II asbestos work.

B. Asbestos faced insulated panels shall be removed in an intact state to the extent feasible.

C. Wet methods shall be used where feasible.

D. Use of cutting machines shall be limited to panels which are too large to wrap or transport in one piece. Cutting machines shall be continuously misted during use, unless a competent person determines that misting substantially decreases worker safety.

E. Panels are attach to wood framing with screws and grommets. Remove panels by backing out screws. Do not break panels around screws.

F. All loose dust left in the stud space shall be HEPA vacuumed immediately.

G. Wrap or bag asbestos faced insulated panels immediately upon removal and before lowering to the ground. Lower panels by crane or hoist no later than the end of the work shift.

H. Upon being lowered, asbestos faced insulated panels shall be transferred to a closed receptacle for transport to the disposal site.

I. Roof level heating and ventilation air intake sources shall be isolated or the ventilation

system shall be shut down when abatement work is in progress.

3.4 FIELD QUALITY CONTROL

A. The testing Laboratory shall have a NIOSH qualified representative on site to monitor the work at all times when asbestos abatement work is in progress.

B. CFR 1926 (f) (3) Periodic Air Monitoring. (i) The employer shall conduct daily monitoring that is representative of the exposure of each employee who is assigned to work within a regulated area who is performing Class I or II work, unless the employer pursuant to (f) (2) (iii) of this section, has made a negative exposure assessment for the entire operation.

C. Site Inspection: While performing asbestos abatement work, the Contractor shall be subject to on site inspection by agency officials. Work shall also be subject to inspection by OSHA and EPA inspectors and/or local building or health officials. If found to be in violation of 29 CFR 1910.1001, the Contractor shall cease all work immediately and until the violation is resolved. Standby time required to resolve the violation shall be at the Contractor's expense. One complete set of equipment (such as respirators and disposable clothing) required for entry to the asbestos control area shall be made available within 2 hours of request by the Contracting Officer or his representative for inspection of the asbestos control area. Such requests will only be made during working hours.

3.5 CLEAN UP AND DISPOSAL

A. Housekeeping: Essential parts of asbestos dust control are housekeeping and cleanup procedures. Maintain all surfaces throughout the work area free of accumulations of asbestos fibers to prevent further dispersion. Give meticulous attention to restricting the spread of dust and debris, keep waste from being distributed over the general area. Use approved industrial vacuum cleaners with a HEPA filter to collect dust and small scrap. The blowing down of the space with compressed air is forbidden. Post appropriate asbestos hazard warning signs. Equip personnel engaged in cleaning up asbestos scrap and waste with necessary respiratory equipment and protective clothing. When cleanup is completed certify the area as safe before the signs are removed.

B. Disposal of Friable Asbestos: Collect and dispose of friable asbestos, waste, scrap, debris, bags, containers, equipment and asbestos-contaminated clothing which may produce airborne concentrations of asbestos fibers in sealed impermeable bags. Prior to placing in bags or containers, wet down asbestos wastes to reduce airborne concentrations. Waste asbestos material shall be disposed of in accordance with all Federal regulations implementing the intent of the Resource Conservation and Recovery Act (40 CFR 260-265) at an Environmental Protection Agency (EPA) approved sanitary landfill. The "small quantity exclusion" of the regulations shall not apply to disposal of waste asbestos materials.

C. Transportation to Waste Disposal Site:

1. As work progresses, store all removed ACM in locked, closed-top containers or dumpsters after first being sealed in labeled containers for asbestos containing waste. Transport ACM to a prearranged disposal location in closed-top dumpsters. Disposal shall be in accordance with regulatory requirements of NESHAP (National Emission Standard for Hazardous Air Pollutants) and applicable local guidelines.
2. Drivers transporting asbestos-containing waste shall be properly trained in correct waste handling procedures. Drivers shall be responsible for retaining all dump receipts, trip tickets, transportation manifests or other documentation of disposal, which will be provided to the Contracting Officer.

D. Final Cleanup and Removal of Enclosure: The Contracting Officer or his designated representative will inspect the work area prior to decontamination and removal of enclosure. Visual observation of asbestos materials, dust or debris is not permitted on any surface in or around the work area. Clean work area in accordance with EPA approved methods, then perform air sampling for clearance purposes.

E. Contracting Officer approval of final cleaning and restoration of the work area is required.

3.9 PROJECT CLOSE-OUT

A. Upon completion of the project, a close-out packet shall be submitted to the Contracting Officer which shall include the following information as applicable to this project:

1. Certification of worker's acknowledgment.
2. Workers' physicals and certifications.
3. Industrial hygiene reports/air sample results.
4. Sign-in/sign-out logs.
5. Map(s) showing location of disposal site and routes from the construction site to the disposal site.
6. Transportation and disposal manifests indicating quantity, type, and dates of disposal.
7. Final inspection lists and certificates of clearances signed by the CIH and Contractor.

END OF SECTION 02085

SECTION 02086 - ASBESTOS CONTAMINATION CONTROL

PART 1 - GENERAL

1.01 CONTROL AREA:

A. The control area includes the following: The control area shall include the entire area where work is taking place. Where work is taking place in a plenum, the occupied area under the plenum shall be the control area. Where work is to be done on a floor when the underside of the deck contains friable asbestos, the control area is to be sealed off will be the area below the deck.

B. Related Work Specified in Other Sections: Section 01546, "Safety and Health," applies to all work covered by this section.

1.02 QUALITY ASSURANCE:

A. Laboratory Qualifications: Laboratory shall be regularly engaged in asbestos testing, and personnel used for monitoring airborne concentrations of asbestos fibers shall be proficient in this field.

B. Asbestos Control Limits: Air concentrations of asbestos inside and outside the control area shall not exceed the ambient level in the area before work was started.

1.03 REFERENCES:

A. American National Standards Institute (ANSI) Publication:

Z9.2-79 Fundamentals Governing the Design and Operation of Local Exhaust Systems

B. American Society for Testing and Materials (ASTM) Publication:

E 849-82 Safety and Health Requirements relating to Occupational Exposure to Asbestos

C. Code of Federal Regulations (CFR):

29 CFR 1910.1001, Occupational Safety and Health Act (OSHA)

29 CFR 1910.20, Subpart C, General Safety and Health Provisions

40 CFR 61, Subparts A and M: U.S. Environmental Protection Agency Regulations for Asbestos

29 CFR 1910.134.OSHA Respiratory Requirements.

D. State and Local Regulations: The Contractor is required to contact state and local authorities regarding all regulations applicable to all work items under this contract involving asbestos contamination control.

1.04 SUBMITTALS:

A. Plan of Action: Submit a detailed plan of the procedures proposed for use in complying with the regulations included in this specification. The plan shall include the location and layout of decontamination areas, and methods to be used to assure the safety of building occupants and visitors to the site. The plan must be approved by the Contracting Officer prior to commencement of work.

B. Laboratory Qualification Information: Submit proof of qualifications of testing laboratory and personnel. Accreditation by the American Industrial Hygiene Association (AIHA) for asbestos work; and certification that persons counting the samples have been judged proficient by successful participation in the National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing (PAT) Program, shall be considered sufficient proof of compliance. Submittal must be approved by the Contracting officer prior to beginning any testing.

C. Certificates of Compliance: Submit certification that vacuums, ventilation equipment, and other equipment required to contain airborne asbestos fibers conform to ANSI Z9.2.

1.05 CONTRACTOR RESPONSIBILITY: The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local regulations pertaining to the protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State, and local regulations, and shall hold the government harmless for failure to comply with any applicable safety or health regulation on the part of himself, his employees, or his subcontractors.

1.06 PROJECT/SITE CONDITIONS:

A. Means of Egress: Establish and maintain emergency and fire exits from the work area.

B. Use of Existing Facilities: The Contractor will not be permitted to use any existing facilities at the site(s) for decontamination purposes. This shall apply to personnel, as well as equipment. The Contractor will be required to furnish such facilities and must clearly demonstrate their use on his/her plan of action.

C. Maintenance of Existing Equipment: The Contractor will be required to maintain, decontaminate and leave in fully operational condition all equipment within designated control area(s).

D. Environmental Conditions to be Maintained: The Contractor will be required to maintain all environmental conditions, (heat, light, air-conditioning), at the control area(s) existent prior to commencement of work. Any mechanical or similar penetration into the control area which compromises the isolation system employed by the Contractor, shall be sealed off according to all applicable local, state and federal regulations and guidelines for such penetrations.

E. Access to Work Area: Access to work areas shall be through decontamination areas. The Contractor's and designated Government personnel only will be permitted access to the work area. The Government's personnel will be designated prior to the commencement of work. The number of Government personnel is subject to change. The Contractor will be given prior notification of any additional Government personnel requiring access to the site.

1.07 SEQUENCING/SCHEDULING:

A. The Contractor will be required to meet with and develop a sequence of work schedule with the Facilities Manager, for all work covered by this specification. The Contractor will be required to establish items such as, vacating of work areas, work hours and prior notification requirements before commencement of work.

PART 2 - PRODUCTS

2.01 EQUIPMENT: Equipment, including protective clothing and respirators, if required in the execution of this contract and provided to visitors to the site, shall comply with ASTM E 849 and with the applicable Federal, State, and local regulations.

PART 3 - EXECUTION

3.01 PREPARATION:

A. Isolate the control area for the duration of the work by completely sealing off all openings and fixtures in the work area, including but not limited to, heating and ventilation ducts, doorways, corridors, windows, and lighting with plastic sheeting taped securely in place.

B. Build double barriers of plastic sheeting at all entrances and exits to the work area so that the work area is always closed off by one barrier when workers enter or exit.

C. Cover all floor and wall surfaces in the work area with plastic sheeting taped securely in place to protect from damage.

D. Prior to start of work, clean all removable items and equipment. Remove them from the work area and store as directed.

E. Cover all non-removable items and equipment in the work area with plastic sheeting taped securely in place.

F. Remove all heating, ventilation, and air-conditioning system filters, pack them in sealable plastic bags (6 mil minimum) for disposal in the approved waste disposal site and replace them with new filters.

G. Post warning signs and labels as required by 29 CFR 1910.1001, ASTM E 849, and as directed by the Contracting Officer.

3.02 WORK PROCEDURE:

A. General Procedures: Perform all work and comply with the general safety and health provisions in conformance with 29 CFR 1910.1001 and 29 CFR 1910.20, respectively.

B. Local Exhaust System: Provide a local exhaust system in the control area as required to meet the asbestos control limit. The local exhaust system shall be in accordance with ANSI Z9.2, using High Efficiency Particulate Air (HEPA) filters. Equip exhaust openings with the necessary filters required to reduce the airborne asbestos concentration to below the asbestos control limit. Local exhaust equipment must be sufficient to maintain a negative air pressure in the asbestos control area. In no case shall the building ventilation system be used as the local exhaust system for the asbestos control limit. Filtering in vacuums and exhaust equipment shall conform to ANSI Z9.2.

C. Coordination of Work of all Trades: Coordinate the work of all trades to assure that their work is performed in accordance with the applicable regulations and that the asbestos control limits are maintained at all times both inside and outside the control area.

3.03 FIELD QUALITY CONTROL:

A. Monitoring: Monitoring of airborne concentrations of asbestos shall be in accordance with 29 CFR 1910.1001 and ASTM E 849. Monitor the airborne concentration of asbestos before starting work to obtain a baseline fiber concentration in the affected areas. Then monitor once every four hours, during the work shift inside the asbestos work area, outside the entrance to the asbestos work area and at the exhaust opening of the local exhaust system. If monitoring shows airborne concentrations greater than the asbestos control limits, stop all work, correct the conditions causing the excessive levels, and notify the Contracting Officer immediately. In addition, monitor the airborne concentrations of asbestos after final clean-up and removal of the enclosure of the asbestos control area, in accordance with paragraph "Final Clean-Up and Removal of Enclosure."

B. Site Inspection: While performing the work, the Contractor shall be subject to on site inspection by agency officials. Work shall also be subject to inspection by OSHA and EPA inspectors and/or local building or health officials. If found to be in violation of 29 CFR 1910.1001, the Contractor shall cease all work immediately and until the violation is resolved. Standby time required to resolve the violation shall be at the Contractor's expense. One complete set of equipment (such as respirators and disposable clothing) required for entry to the control area shall be made available within 2 hours of request by the Contracting Officer for inspection of the control area. Such requests will only be made during working hours.

3.04 CLEAN-UP AND DISPOSAL:

A. Housekeeping: Essential parts of asbestos contamination control are housekeeping and cleanup procedures. Maintain all surfaces through-out the building free of accumulations of dust to prevent further dispersion. Give meticulous attention to restricting the spread of dust and debris, keep waste from being distributed over the general area or to lower floors. Use approved industrial vacuum cleaners with a HEPA filter to collect dust and small scrap. The blowing down of the space with compressed air is forbidden. Post appropriate asbestos hazard warning signs. In all possible instances workmen shall cleanup their own areas. Equip personnel engaged in cleaning up scrap and waste with necessary respiratory equipment and protective clothing.

B. Disposal of Waste: Collect and dispose of waste, scrap, debris, bags, containers, equipment, and clothing which may produce airborne concentrations of asbestos fibers in sealed impermeable bags. Prior to placing in bags, or containers, wet down wastes to reduce airborne concentrations. Waste material which may contain asbestos shall be disposed of in accordance with all Federal regulations at an Environmental Protection Agency (EPA) approved sanitary landfill. Establish a temporary holding area approved by the Contracting Officer for properly packaged asbestos waste.

C. Final Clean-up and Removal of Enclosure: If fiber concentration does not exceed 0.01 f/cc or the level recommended by EPA, the Contracting Officer or a designated representative may authorize removal of the enclosure. Contracting Officer approval of final cleaning and restoration of the work area is required.

END OF SECTION 02086

SECTION 06200 - FINISH CARPENTRY

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Provide all labor, materials and equipment to install the carpentry work required on the Delivery order using methods, equipment and materials specified herein.

B. Types of finish carpentry work in this section include:

1. Interior running and standing trim,.

C. Builders hardware and wood doors are specified in Division-8 sections.

1.02 QUALITY ASSURANCE:

A. Factory-mark each piece of lumber and plywood with type, grade, mill and grading agency identification; except omit marking from, surfaces to receive transparent finish, and submit mill certificate that material has been inspected and graded in accordance with requirements if it cannot be marked on a concealed surface.

1. Such grading associations or independent inspection agencies shall be certified by Board of Review, American Lumber Standards Committee, to grade species marked or certified.

1.03 SUBMITTALS:

A. Product Data: Submit manufacturer's specifications and installation instructions for each item of factory-fabricated siding and paneling.

B. Samples: Submit the following samples for each species and cut or pattern of finish carpentry.

1. Interior standing and running trim: 2'-0" x full board or molding width, unfinished.

2. Board-type paneling: 2'-0" long x full board width.

3. Plywood paneling: 2'-O" long x panel width.

4. Submit shop drawings of architectural woodwork when required by Delivery Order. Indicate on shop drawings, size, species, matching of panels, profiles of moldings, assembly details, applied surfacing, built in hardware and necessary connections to other trades.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Protect finish carpentry materials during transit, delivery, storage and handling to prevent damage soiling and deterioration.

B. Do not deliver finish carpentry materials, until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in

installation areas. If, due to unforseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas and approved by the Contracting Officer.

1.05 JOB CONDITIONS:

A. Conditioning: Installer shall advise Contractor of temperature and humidity requirements for finish carpentry installation areas. Do not install finish carpentry until required temperature and relative humidity conditions have been stabilized and will be maintained in installation areas.

PART 2 - PRODUCTS

2.01 WOOD PRODUCT QUALITY STANDARDS:

A. Softwood Lumber Standards: Comply with PB 20 snd with applicable grading rules of the respective grading and inspecting agency for the species and products indicated.

B. Plywood Standard: Comply with PS 1/ANSI A199.1.

C. Hardwood Lumber Standard: Comply with National Hardwood Lumber Association (NHLA) rules.

D. Hardwood Plywood Standard: Comply with PS 51.

E. Woodworking Standard: Where indicated for a specific product comply with specified provision of the following:

1. Architectural Woodwork Institute. (AWI) "Quality Standards".

2.02 MATERIALS:

A. General:

1. Nominal sizes are indicated, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber, as applicable, manufactured to the actual sizes as required by PS 20 or to actual sizes and patterns as shown, unless otherwise indicated.

2. Moisture Content of Softwood Lumber: Provide seasoned (KD) lumber having a moisture content from time of manufacture until time of installation not greater than values required by the applicable grading rules of the respective grading and inspecting agency for the species and product indicated.

3. Moisture Content of Hardwood Lumber: Provide kiln-dried (KD) lumber having a moisture content from time of manufacture until time of installation within the ranges required in the referenced woodworking standard.

4. Lumber for Transparent Finish (Stained or Clear): Use pieces made of solid lumber stock.

5. Lumber for Painted Finish: At Contractor's option, use pieces which are either glued-up lumber or made of solid lumber stock.

B. Interior Finish Carpentry:

1. Standing and Running Trim for Painted Finish: Any Western softwood species graded and inspected by WWPA complying with following requirements:

a. Grade for Special (Custom) Sizes and Patterns: Custom for quality of materials and manufacture as required in referenced woodworking standard.

2. Hardwood Plywood Stock Panels: Provide manufacturer's stock hardwood plywood panels complying with applicable requirements of PS 51 for species and grade of face veneers and backing, adhesive, construction, thickness, panel size, and finish.

a. Face Veneer Species: Plain sliced Red Oak.

1) Grade: Premium.

b. Backing Veneer Species: Any hardwood compatible with face species.

1) Grade: Same as face grade.

c. Construction: veneer core.

1) No. of Plies: 5.

d. Thickness: Varies

e. Panel Size: Varies

f. Face Pattern: Plain (no grooves) with veneer edge matched within each panel face to comply with type of match required by referenced product standard.

g. Face Veneer Matching (Panel-to-Panel): Sequence matched from one or similar flitches as required by quantity of panels.

2. Miscellaneous Materials:

a. Fasteners and Anchorages: Provide nails, screws and other anchoring devices of the type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible, and complying with applicable Federal Specifications.

2.03 WOOD TREATMENT:

1. Kiln-dry wood after treatment to a maximum moisture content of 15% for plywood, 19% for lumber.

2. Inspect each piece of number and plywood σ each unit of finish carpentry after drying; do not use twisted, warped, bowed or otherwise damaged or defective wood.

PART 3 - EXECUTION

3.01 PREPARATION:

A. Condition wood materials to average prevailing humidity conditions in installation areas prior to installing.

3.02 INSTALLATION:

A. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacturer with respect to surfaces, sizes or patterns.

B. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level countertops; and with 1/16" maximum offset in flush adjoining 1/8" maximum offsets in revealed adjoining surfaces.

C. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.

D. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum lengths of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, to produce tight fitting joints with full surface contact throughout length of joint. Use scarf joints for end-to-end joints.

E. Anchor finish carpentry work to anchorage devices or blocking built-in or directly attached to substrate. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fasteners heads are required, use fine finishing nails for exposed nailing, countersunk and filled flush with finished surface, and matching final finish where transparent is indicated.

F. Hardwood Plywood Paneling: Where grain character or color variations are noticeable, select and arrange panels on each wall for best match of adjacent panels. Install with uniform tight joints between panels.

1. Attach panels to supports with panel adhesive and temporary bracing or fasteners, plus nailing where covered by moldings (if any), in accordance with manufacturer's instructions for concealed-fastener installation.

2. Apply panel adhesive on supports, immediately prior to panel placement and nailing.

G. Prefinished Hardwood Paneling, Board Type: Install in accordance with manufacturer's instructions for concealed nailing. Arrange in random-width pattern suggested by manufacturer, unless boards are of uniform width. Stagger end joints in random pattern for best visual effect (uniformly distributed on each wall). Install with uniform, joints, with only tongued-and-grooved or end-matched joints within each field of paneling.

1. Where grain character and color of boards vary noticeably, select and arrange boards for best visual effect as directed by the Contracting Officer.

3.03 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION:

A. Repair damaged and defective finish carpentry work wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Joined ares should be uniform in appearance.

B. Clean finish carpentry work on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.

C. Refer to Division-9 sections for final finishing of installed finish carpentry work.

D. Protection: Installer of finish carpentry work shall advise Contractor of final protection and maintained conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION 06200

SECTION 08110 - STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

Provide and install new steel door frames, doors, and louvers as required in the Delivery Order using materials and methods specified.

Install Government furnished steel door frames and/or doors, as required in the Delivery Order using materials and methods specified herein.

1.02 RELATED DOCUMENTS:

A. Finish hardware is specified elsewhere in Division 8.

1.03 QUALITY ASSURANCE:

A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications: Standard Steel Doors and Frames" (SDI-100) and as herein specified.

1.04 SUBMITTALS:

A. Product Data: Submit manufacturer's technical product data substantiating that products comply with requirements.

B. Shop Drawings: Submit for fabrication and installation of steel doors/frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

1. Indicate coordination of glazing frames and stops with glass and glazing requirements.

C. Label Construction Certification: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, submit manufacturer's certification for each door and frame assembly that has been constructed to conform to design, materials and construction equivalent to requirements for labeled construction.

1.05 DELIVERY, STORAGE AND HANDLING:

A. Deliver hollow steel work cartoned or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.

B. Inspect hollow steel work upon delivery for damage. Minor damages may be repaired provided refinish items are equal in all respects to new work and acceptable to Contracting Officer; otherwise, remove and replace damaged items as directed.

C. Store doors/frames at building site under cover. Place units on minimum 4" high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, carton immediately. Provide 1/4" spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A 569 and ASTM A 568.

B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and ASTM A 568.

C. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 526, with ASTM A 525, G60 zinc coating, millphosphatized.

D. Supports and Anchors: Fabricate of not less than 18 gauge galvanized sheet steel.

E. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanize items to be built into exterior walls, complying with ASTM A 153, Class C or D as applicable.

F. Shop Applied Paint:

1. Primer: Rust-inhibitive metallic oxide enamel or synthetic resin paint, either air-drying or baking, suitable as a base for specified finish paints.

2. Finish: Manufacturer's standard baking epoxy or enamel paint.

2.02 FABRICATION, GENERAL:

A. Fabricate steel door/frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at project site. Comply with SDI-100 requirements as follows:

1. Interior Doors: SDI-100, Grade II, heavy-duty, Model 1 (Full Flush, Hollow Steel Construction), minimum 18-gage faces.

B. Fabricate exposed faces of doors and panels, including stiles and rails of non-flush units, from only cold-rolled steel.

C. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel (at fabricator's option).

D. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.

E. Finish Hardware Preparation:

1. Prepare doors and frames to receive mortise and concealed finish hardware in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A 115 series specifications for door and frame preparation for hardware.

2. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface applied finish hardware may be done at project site.

3. Locate finish hardware as shown on final shop drawings or, if not shown, in accordance with "Recommended Locations for Builder's Hardware," published by Door and Hardware Institute.

F. Shop Painting:

1. Clean, treat, and paint exposed surfaces of steel door/window frame units, including galvanized surfaces.

2. Clean steel surfaces of mill scale, rust, oil#, grease, dirt, and other foreign materials before application of paint.

3. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

4. Apply finish coat to doors/frames indicated as prefinished by electrostatic spraying and baking, to produce a paint thickness of 1.25 mils.

2.03 STANDARD STEEL DOORS:

A. Provide steel doors of grades and styles indicated on schedules.

B. Door Louvers:

1. Provide sightproof stationary louvers for interior doors where indicated, constructed of inverted V-shaped or Y-shaped blades formed of 24 gage cold-rolled steel set into 20 gage steel frame, conforming to SDI-111.

2.04 STANDARD STEEL FRAMES:

A. Provide steel frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 16-gage cold-rolled furniture steel.

1. Fabricate frames with mitered corners knocked-down, for field assembly.

B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-swing frames and 2 silencers on heads of double-swing frames.

C. Plaster Guards: Provide 26 gage steel plaster guards or mortar boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. General: Install standard steel doors/frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.

B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions For Steel Frames", unless otherwise indicated.

1. Except for frames located at in-place concrete or masonry and at drywall installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.

2. In masonry construction, locate 3 wall anchors per jamb at hinge and strike levels.

3. At in-place concrete or masonry construction, set frames and secure to adjacent construction with machine screws and masonry anchorage devices.

4. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In open steel stud partitions, place studs in wall anchor notches and wire tie. In closed steel stud partitions, attach wall anchors to studs with tapping screws.

C. Door Installation:

1. Fit hollow steel doors accurately in frames, within clearances specified in SDI-100.

3.02 ADJUST AND CLEAN:

A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. Protection Removal: Immediately prior to final inspection, remove protective plastic wrappings from prefinished doors.

C. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION 08110

SECTION 08210 - WOOD DOORS

PART 1 - GENERAL

1.1 General:

A. Quality Standards: Comply with NWWDA I.S.1 and AWI "Architectural Woodwork Quality Standards".

1. Comply with WIC "Manual of Millwork" for requirements in the door grade comparable to AWI grade indicated and exceeding those in other referenced standards.

1.2 Products:

A. Manufacturers: Firms regularly engaged in the manufacture of wood doors, of types, sizes, and materials required, whose products have been in satisfactory use in similar service for not less than 3 years.

B. General Wood Door Product Requirements: Provide doors with same exposed surface material on both faces of each door, unless otherwise indicated.

1. Transom and Side Panels: Match quality, construction and appearance of associated wood doors.

2. Louvers: Manufacturer's standard louvers of type, materials and size indicated:

a. Material: Solid wood.

b. Material: Factory primed for paint finish.

C. Exterior Solid Core Flush Doors for Opaque Finish: As follows:

1. Faces: Medium density overlay over standard thickness hardwood face veneers.

2. Construction: PC-5 (Particleboard core, 5-ply).

3. Construction: SLC-5 (Glued block core, 5-ply).

D. Exterior Solid Core Doors for Transparent Finish: As follows:

1. AWI Grade: Premium.

2. Construction: PC-5 (Particleboard core, 5-ply).

E. Interior Solid Core Doors for Transparent Finish: As follows:

1. AWI Grade: Premium.

2. Construction: PC-5 (Particleboard core, 5-ply).

F. Interior Fire-Rated Solid Core Doors: Labeled and listed for rating indicated, by testing and inspection agency acceptable to authorities having jurisdiction, complying with the following requirements:

1. Faces and AWI Grade: Match faces of non-rated doors in same area of building, unless otherwise indicated.

2. Edge Construction: Manufacturer's standard laminated edge construction for improved screw-holding capability and split resistance.

3. Pairs: Furnished formed steel edges and astragals for pairs of fire-rated doors, unless otherwise indicated.

    a. Provide fire-rated pairs with fire-retardant stiles which are labeled and listed for kinds of applications indicated without formed steel edges and astragals.

4. Metal Frames for Light openings in Fire Doors: Manufacturer's standard 18-gage cold-rolled steel frame, factory-primed, approved for use in door of fire-rating indicated.

5. Wood Beads for Light openings in Fire Doors: Manufacturer's standard fire-rated wood-veneer beads matching veneer species of door faces.

6. Louvers: Factory install louvers in prepared openings.

7. Flash tops of exterior out-swinging doors.

G. Shop seal faces and edges of doors for field-applied transparent finish with stain (if required) and other required pretreatment and first coat of finish as specified in Division-9 section "Painting".

H. Prefinish wood doors at factory where indicated on schedules or drawings as "prefinished".

1. Transparent Finish: Comply with requirements indicated for grade, finish system, staining effect and sheen.

    a. AWI Grade: Premium.

    b. Finish: AWI System #2 catalyzed lacquer or #3 alkyd-urea conversion varnish as standard with manufacturer.

    c. Finish: Manufacturer's standard finish with performance requirements comparable to either AWI System #2 catalyzed lacquer or AWI System #3 alkyd-urea conversion varnish.

    d. Staining: Match approved sample for color.

    e. Effect: Open grain finish.

    f. Effect: Filled finish.

g. Sheen: Satin-medium rubbed effect.

h. Sheen: Semi-gloss.

1.3 Installation:

A. Install wood doors to comply with manufacturer's instructions and of referenced AWI standard and as indicated.

1. Install fire-rated doors in corresponding fire-rated frames in accordance with requirements of NFPA No. 80.

B. Align and fit door in frames with uniform clearances and bevels. Machine doors for hardware. Seal cut surfaces after fitting and machining.

C. Prefit Doors: Fit to frames for uniform clearance at each edge.

D. Factory-Finished Doors: Restore finish before installation, if fitting or machining is required at the job site.

PARTS 2 & 3 – (not used)

END OF SECTION 08210

SECTION 08510 - STEEL WINDOWS

PART 1 - GENERAL

1.1 General:

A. Standards: comply with applicable SWI recommended specifications.

1.2 Materials/Fabrication:

A. Manufacturers: Firms regularly engaged in the manufacture of steel windows, of types, sizes, and material required, whose products have been in satisfactory use in similar service for not less than 3 years.

B. Types (Operation): Drawings indicate locations of operating sash of the following types:

C. Fixed units.

D. SWI Grade (Classification): Commercial.

E. Subframes, Mullions: Provide hot-rolled or cold-formed steel shapes, welded fabrication where possible.

F. Fasteners: Provide bronze/brass, stainless steel or, where concealed from weather, zinc coated steel.

G. Glazing Stops: Provide manufacturer's standard extruded aluminum or formed steel, snap-on or screwed type.

H. Hardware: Manufacturer's standard design, of solid bronze with steel or bronze operating arms.

I. Shop Prime-Coat Finish: Hot alkali cleaning, rinse, hot phosphate treatment, chromic acid rinse, drying metal primer dip coating, oven dry at 300 deg. F (149 deg. C), 1.0-mil dry film thickness.

J. Galvanized and Prime-coat Finish: SSPC-SP 1-63 cleaning, SSPC-SP 8-63 pickling, and ASTM A 386 hot-dip galvanizing; followed by hot phosphate treatment, chromic acid rinse, drying, metal primer dip coating, oven dry at 300 deg. F (149 deg. C), 1.0 mil dry film thickness.

1.3 Installation/Erection:

A. Anchor window units securely in place. Seal entire perimeter of each unit as shown; comply with applicable requirements of Division-7 "Joint Sealers" section. Adjust operating sash (vents) for proper operation, and lubricate hardware. Clean surfaces of window units and repair minor damage of finish. Clean glass promptly after installation.

PARTS 2 & 3 – (not used)

END OF SECTION 08510

SECTION 08700 - FINISH HARDWARE

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Definition: "Finish Hardware" includes items known commercially as finish hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame. Types of items in this section include (but are not necessarily limited to):

B. Install Government furnished hardware set as shown on the Delivery Order using materials and methods specified herein.

C. Furnish and install new hardware as shown on the Delivery Order using materials and methods specified herein.

D. Types of finish hardware required include the following:

1. Hinges
2. Spring hinges
3. Lock cylinders and keys
4. Lock and latch sets
5. Bolts Exit devices
6. Push/pull units
7. Closers
8. Overhead holders
9. Miscellaneous door control devices
10. Door trim units
11. Protection plates
12. Astragals or meeting seals on pairs of doors
13. Thresholds

E. Silencers included integral with hollow metal frames are specified with door frames elsewhere in Division 8.

1.02 QUALITY ASSURANCE:

A. Manufacturer: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.

B. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years, and who is, or who employs an experienced architectural hardware consultant who is available, at reasonable times during the course of the work, for consultation about project's hardware requirements, to Contracting Officer and Contractor.

1.03 SUBMITTALS:

A. Product Data: Submit manufacturers technical product data for each item of hardware in accordance with Division 1 section "Submittals". Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish.

B. Hardware Schedule: Submit final hardware schedule in manner indicated below and in accordance with Division 1 section "Submittals". Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand function and finish of hardware.

1. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:

a. Type, style, function, size and finish of each hardware item..

b. Name and manufacturer of each item.

c. Fastenings and other pertinent information.

d. Explanation of all abbreviations, symbols, codes, etc. contained in schedule.

e. Mounting locations for hardware.

f. Door and frame sizes and materials.

g. Keying information.

2. Submittal Sequence: Submit initial draft of schedule along with essential product data in order to facilitate the fabrication of other work (e.g., hollow metal frame) which is critical in the project construction schedule. Submit final draft of schedule after samples, product data, coordination with shop drawings of other work, delivery schedules, and similar information has been completed and accepted.

3. Keying Schedule: Submit separate detailed schedule indicating clearly how the Government's final instructions on keying of locks has been fulfilled.

1.04 PRODUCT HANDLING:

A. Tag each item or package separately, with identification related to the final hardware schedule, and include basic-installation instructions with each item or package.

B. Packaging of hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in the same container.

C. Inventory hardware jointly with representatives of the hardware supplier and the hardware installer until each is satisfied that the count is correct.

D. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.

E. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

PART 2 - PRODUCTS

2.01 SCHEDULED HARDWARE:

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this section. Products are identified by using hardware designation numbers of the following.

1. ANSI/BHMA designations used elsewhere in this section or in schedules to describe hardware items or to define quality or function are derived from the following standards. Provide products complying with these standards and requirements specified elsewhere in this section.

a. Butts and Hinges: ANSI A156.1 (BHMA 101)

b. Locks & Lock Trim: ANSI A156.2 (BHMA 601)

c. Exit Devices: ANSI A156.3 (BHMA 701)

d. Door Controls - Closers: ANSI A156.4 (BHMA 301)

e. Architectural Door Trim: ANSI A156.6 (BHMA 1001)

f. Template Hinge Dimensions: ANSI A156.7 (BHMA)

g. Auxiliary Hardware: ANSI A156.16 (BHMA 1202)

2. Materials & Finishes: ANSI A156.18 (BHMA 1301)

2.02 MATERIALS AND FABRICATION:

A. General:

1. Hand of door: Match existing direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement.

2. Manufacturer's Name Plate: Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location (omit removable

nameplates), except in conjunction with required UL or FM labels and as otherwise acceptable to Contracting Officer.

a. Manufacturer's identification will be permitted on rim of lock cylinders only.

3. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI A156 series standard for each type hardware item and with BHMA 1301 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.

4. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.

5. Furnish screws for installation, with each hardware item,. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible,.including "prepared for paint" in surfaces to receive painted finish.

6. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Do not use through-bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each through-bolt or sex screw fasteners.

7. Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools as needed for Government's continued adjustment, maintenance, and removal and replacement of finish hardware.

2.03 HINGES, BUTTS & PIVOTS:

A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

B. Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

1. Steel Hinges: Steel pins.

2. Non-ferrous Hinges: Stainless steel pins.

3. Exterior Doors: Non-removable pins.

4. Out-swing Corridor Doors: Non-removable pins.

5. Interior Doors: Non-rising pins.

6. Tips: Flat button and matching plug, finished to match leaves, except where hospital tip (HT) indicated.

7. Number of hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.

2.04 LOCK CYLINDERS AND KEYING:

A. General: Supplier will meet with Government to finalize keying requirements and obtain final instructions in writing.

B. Review the keying system with the Contracting Officer and provide the type required (,master, grandmaster or great-grandmaster), either new or integrated with Government's existing system.

C. Equip locks with cylinders for interchangeable-core pin tumbler inserts. Furnish only temporary inserts for the construction period, and remove when directed.

1. Deliver permanent cores and keys to Contracting Officer in separate packaging from temporary inserts.

D. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.

E. Comply with Contracting Officer's instructions for master keying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.

1. Permanently inscribe each key with number that identifies cylinder or lock manufacturer, key symbol, and "U.S. PROPERTY - DO NOT DUPLICATE."

F. Key Material: Provide keys of nickel silver only.

G. Key Quantity: Furnish 3 change keys for each lock; 5 master keys for each master system; and 5 grandmaster keys for each grandmaster system.

1. Furnish one extra blank for each lock.

2. Deliver keys to Government's representative.

2.05 LOCKS, LATCHES AND BOLTS:

A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.

1. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.

2. Provide roller type strikes where recommended by manufacturer of the latch and lock units.

B. Lock Throw: Provide 5/8" minimum throw of latch and deadbolt used on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

1. Provide 1/2" minimum, throw on other latch and deadlock bolts.

C. Flush Bolt Heads: Minimum, of 1/2" diameter rods of brass, bronze or stainless steel, with minimum 12" long rod for doors up to 7'-O" in height. Provide longer rods as necessary for doors exceeding 7'-O" in height.

D. Exit Device Dogging: Except on fire-rated doors, wherever closers are provided on doors equipped with exit devices, equip the units with keyed dogging device to hold the push bar down and the latch bolt in the open position.

E. Rabbeted Doors: Where rabbeted door stiles are indicated, provide special rabbeted front on lock and latch units and bolts.

2.06 PUSH/PULL UNITS:

A. Exposed Fasteners: Provide manufacturer's standard exposed fasteners for installation; through-bolted for matched pairs, but not for single units.

2.07 CLOSERS AND DOOR CONTROL DEVICES:

A. Size of Units: Except as otherwise specifically indicated, comply with the BHMA recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use. Corner or soffit mounting brackets shall not be used.

B. Accessible Manual Closers: Where manual closers are indicated for interior doors, provide adjustable units complying with GSA Accessibility Standard provisions for door opening force and delayed action closing.

C. Flush Floor Plates: Provide finished metal flush floor plates for floor closers except where thresholds are indicated and cover plate is specified to be an integral part of threshold. Finish floor plate to match hardware sets, unless otherwise indicated.

D. Provide grey resilient parts for exposed bumpers.

2.08 DOOR TRIM UNITS:

A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units); either machine screws of self-tapping screw.

B. Fabricate edge trim of stainless steel, not more than 1/2" nor less than 1/16" smaller in length than door dimension.

C. Fabricate protection plates (armor, kick or mop) not more than 1/2" less than door width on stop side and not more than 1/2" less than door width on pull side, x the height indicated.

1. Metal Plates: Brass/Bronze, 0.062" (16 gauge).

2.09 THRESHOLDS:

A. General: Except as otherwise indicated provide standard metal threshold unit of type, size and profile as shown or scheduled.

2.10 HARDWARE FINISHES:

A. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units if no latch-lock sets) for color and texture.

B. Provide finishes which match those established by BHMA or, if none established, match the Contracting Officer's sample.

C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for the applicable units of hardware by referenced standards.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Mount hardware units at existing heights, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Contracting Officer.

B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in) another way, coordinate removal, storage and reinstallation or application of surface protection with finishing work specified in the Division-9 sections. Do not install surface-mounted items until finishes have been completed on the substrate. Mount closers on room side of corridors and lobbies unless fire labeling prohibits.

C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

3.02 ADJUST AND CLEAN:

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Immediately prior to completion and acceptance of project, make final adjustments in finish hardware installation, remove construction cores from cylinders and open sealed packaging with permanent cores in presence of Contracting Officer and install proper core in cylinders. Demonstrate to Contracting Officer that each item is in perfect working order and that tagged keys operate respective locks. Correct items of hardware not acceptable to Contracting Officer. Deliver tagged keys to contracting officer upon acceptance of each core cylinder installation.

C. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

3.03 HARDWARE SCHEDULE:

A. Refer to individual task orders or delivery orders (GSA Form 300) for list of doors requiring hardware.

END OF SECTION 08700

SECTION 08800 - GLASS AND GLAZING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

A. Definitions: "Glass" includes both primary and fabricated glass products as described in FGMA "Glazing Manual". "Glazing" includes glass installation and materials used to install glass.

B. Provide and install glass/glazing, required on the Delivery order using materials and methods specified herein.

1.2 SYSTEM PERFORMANCES:

A. Provide glass and glazing that has been produced, fabricated and installed to withstand normal temperature changes, wind loading, impact loading (where applicable), without failure including loss or breakage of glass, failure of sealants or gaskets to retain watertight and airtight, deterioration of glass and glazing materials, and other defects in the work.

1.3 QUALITY ASSURANCE:

A. Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.

B. Safety Glazing Standard: Where safety glass is indicated or required by authorities having jurisdiction, provide type of products indicated which comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.

1. Subject to compliance with requirements, provide safety glass permanently marked with certification label of Safety Glass Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.

C. Field-Constructed Mock-Up: Prepare mock-ups for the following types of glass in locations directed by Contracting Officer. Construct mock-ups to match glazing systems required for project, including typical lite size, framing system, and glazing materials and methods. Obtain Contracting Officer's acceptance of visual qualities before proceeding with the work. Retain mock-ups in undisturbed condition during construction as a standard for judging completed work.

1. Coated glass.

2. Tempered glass.

3. Spandrel glass.

4. Fire Resistance Rated Wire Glass.

D. Single Source Responsibility: Provide materials obtained from one source for each type of glass and glazing product.

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's technical data for each glazing material and fabricated glass product required, including installation and maintenance instructions.

B. Samples: Submit, for verification purposes, 12" square samples of each type of glass indicated except for clear single pane units, and 12" long samples of each color required (except black) for each type of sealant or gasket exposed to view. Install sealant or gasket sample between two strips of material representative of adjoining framing system, in color.

C. Certificate: Submit certificates from respective manufacturers attesting that glass and glazing materials furnished for project comply with requirements.

1. Separate certification will not be required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authorities having jurisdiction.

D. Test Reports: Submit sealant-substrate adhesion and sealant compatibility test reports, including glazing sealant manufacturer's findings and recommendations.

1.5 DELIVERY, STORAGE, AND HANDLING:

A. Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

1.6 PROJECT CONDITIONS:

A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrate is wet due to rain, frost, condensation or other causes. Install glazing sealants only when temperatures are in middle third of manufacturer's recommended installation temperature range.

1. Install liquid sealants at ambient and substrate temperatures above 40 degrees F (4.4 degrees C).

1.7 SPECIFIED PRODUCT WARRANTY:

A. Manufacturer's Warranty on Laminated Glass: Provide written warranty signed by manufacturer of laminated glass agreeing to furnish f.o.b. point of manufacture, freight allowed project site, within specified warranty period indicated below, laminated glass units which develop manufacturing defects. Manufacturing defects are defined as edge separation or delamination which materially obstructs vision through glass.

1. Warranty Period: Manufacturer's standard but not less than 4 years after date of substantial completion.

B. Manufacturer's Warranty on Coated Glass Products: Provide written warranty signed by manufacturer of coated glass agreeing to furnish f.o.b. point of manufacture, freight allowed project site, within specified warranty period indicated below, coated glass units which develop manufacturing defects. Manufacturing defects are defined as peeling, cracking or deterioration in metallic coating due to normal conditions and not due to handling or installation or cleaning practices contrary to glass manufacturer's published instructions.

1. Warranty Period: Manufacturer's standard but not less than 5 years after date of substantial completion.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL:

A. Primary Glass Standard: Provide primary glass which complies with FS DD-G-451 requirements, including those indicated by reference to type, class, quality, and form.

B. Heat-Treated Glass Standard: Provide heat-treated glass which complies with FS DD-G-1403 requirements, including those indicated by reference to grade, style, type, quality, and class.

C. Sizes: Fabricate glass to sizes required for glazing openings indicate on Delivery Order, with edge clearances and tolerances complying with recommendations of glass manufacturer. Provide thicknesses indicated or, if not otherwise indicated, as recommended by glass manufacturer for application indicated.

2.2 PRIMARY GLASS PRODUCTS:

A. Clear Float Glass: Type I, class 1 (transparent), quality q3 (glazing select).

B. Tinted Float Glass: Type I, class 2 (heat absorbing and light reducing), quality q3 (glazing select), of tint and with performance characteristics for thickness specified in the Delivery Order.

C Fire Resistance Rated Wire Glass: Provide wire glass products that are identical to those tested per ASTM E 163 (UL 9) and are labeled and listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

2.3 GLAZING SEALANTS:

A. General: Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants which have performance characteristics suitable for applications indicated and conditions at time of installation.

B. Compatibility: Select sealants with proven compatibility with surfaces contacted in the installation and under service conditions indicated, as demonstrated by testing and field experience.

C. Colors: Provide color of exposed sealants indicated or, if not otherwise indicated, as selected by Contracting Officer from manufacturer's standard colors.

D. Silicone Glazing Sealant: Single component elastomeric silicone sealant complying with FS TT-S-001543, Class A, non-sag; and with ASTM C 920, Type S, Grade NS, Class 25, Use G and, as applicable to use indicated, Uses A and O.

2.4 GLAZING GASKETS:

A. Lock-Strip Gaskets: Neoprene extrusions of size and shape indicated, fabricated into frames with molded corner units and zipper lock strips, complying with ASTM C 542; black.

2.5 MISCELLANEOUS GLAZING MATERIALS:

A. Compatibility: Provide materials with proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

C. Setting Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 Shore A durometer hardness.

D. Spacers: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.

E. Edge Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) of glass.

F. Compressible Filler Rods: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, flexible and resilient, with 5-10 psi compression strength for 25% deflection.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Require Glazier to inspect work of glass framing erector for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for presence and functioning of weep system; for existence of minimum required face or edge clearances; and for effective sealing of joints. Obtain Glazier's written report listing conditions detrimental to performance of glazing work. Do not allow glazing work to proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION:

A. Pre-Installation Fleeting: At Contractor's direction, Glazier, sealant and gasket manufacturers' technical representatives, glass framing erector and other trades whose work affects glass and glazing shall meet at project site to review procedures and time schedule proposed for glazing and coordination with other work.

B. Clean glazing, channels and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrate. Remove lacquer from metal surfaces where elastomeric sealants are indicated for use.

3.3 GLAZING GENERAL:

A. Comply with combined printed recommendations of glass manufacturers, of manufacturers of sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.

B. Glazing channel dimensions as indicated in details are intended to provide for necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by job conditions at time of installation.

C. Protect glass from edge damage during handling and installation; use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass with flares or bevels along one horizontal edge which would occur in vicinity of setting blocks so that these are located at top of opening. Remove from project and dispose of glass units with edge damage or other imperfections of kind that, when installed, weakens glass and impairs performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

3.4 GLAZING:

A. Install setting blocks of proper size in sill rabbet, located one quarter of glass width from, each corner, but no closer than 6", unless otherwise required. Set blocks in thin course of sealant which is acceptable for heel bead use.

B. Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches, except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

C. Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.

D. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

E. Provide compressible filler rods or equivalent back-up materials, as recommended be sealant and glass manufacturers, to prevent sealant from extruding into glass channel weep systems and from adhering to joints back surface as well as to control depth of sealant for optimum performance, unless otherwise indicated.

F. Force sealants into glazing channels to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

G. Tool exposed surfaces of sealants to provide a substantial "wash" way from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.

H. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement.

I. Miter cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent pull away at corners; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.5 PROTECTION AND CLEANING:

A. Protect exterior glass from breakage immediately upon installation by use of crossed streamers attached to framing and held away from, glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove immediately by method recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less often than once a month, for build-up of dirt, scum, alkali deposits or staining. When examination reveals presence of these forms of residue, remove by method recommended by glass manufacturer.

D. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

E. Wash glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Wash glass by method recommended by glass manufacturer.

END OF SECTION 08800

SECTION 09250 - GYPSUM DRYWALL

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Furnish and install prefinished gypsum board partition as described in the Delivery order, using materials and methods described herein.

B. Furnish and install new gypsum board on new and existing metal or wood studs as described in Delivery Order using materials and methods specified herein.

C. Remove partitions as described in the Delivery Orders using materials and methods specified herein.

D. Install Government furnished sound blanket in partitions as described in the Delivery order using materials and methods specified herein.

E. Install Government furnished prefinished gypsum board partition(s) as described in the Delivery Order, using materials and methods specified herein.

F. Types of work include:

1. Gypsum drywall including screw-type metal support system.

2. Gypsum drywall directly applied to solid (continuous) substrate.

3. Gypsum drywall applied to wood framing and furring.

4. Gypsum backing boards for application of other finishes.

5. Sound control batt insulation.

6. Sound control door panel.

7. Install Gov't furnished sound blanket in partition.

G. Wood framing and furring are specified in Division-6.

1.02 QUALITY ASSURANCE:

A. Gypsum Board Terminology Standard: GA-505 by Gypsum Association.

B. Single-Source Responsibility: Obtain gypsum board products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum boards.

1.03 SUBMITTALS:

A. Product Data: Submit manufacturer's product specifications and installation instructions for each gypsum drywall component, including other data as may be required to show compliance with these specifications.

1.04 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and in manner to keep them, dry, protected from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack boards flat to prevent sagging.

C. Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal corner beads and trim from being bent or damaged.

1.05 PROJECT CONDITIONS:

A. Environmental Requirements, General: Comply with requirements of referenced gypsum board application standards and recommendations of gypsum board manufacturer, for environmental conditions before, during and after application of gypsum board.

B. Ventilation: Ventilate building spaces as required to remove water in excess of that required for drying of joint treatment material immediately after its application. Avoid drafts during dry, hot weather to prevent too rapid drying.

PART 2 - PRODUCTS:

2.01 METAL SUPPORT MATERIALS:

A. Wall/Partition Support Materials:

1. Studs: ASTM C 645; 0.0179" min. thickness of base metal unless otherwise indicated.

a. Depth of Section: 3-5/8", except as otherwise indicated.

b. Runners: Match studs; type recommended by stud manufacturer for floor and ceiling support of studs, and for vertical abutment of drywall work at other work.

2. Furring Members: ASTM C 645; 0.0179" min. thickness of base metal, hat-shaped.

a. Where shown as "Resilient," provide manufacturer's special type designed to reduce sound transmission.

3. Z-Furring Members: Manufacturer's standard screw-type z-shaped furring members; ASTM A 525, G60, 0.0179" min. thickness of base metal; of depth indicated; designed for mechanical attachment of insulation boards or blankets to monolithic concrete and masonry walls.

4. Fasteners for Furring Members: Type and size recommended by furring manufacturer for the substrate and application indicated.

2.02 GYPSUM BOARD:

A. Gypsum Wallboard: ASTM C 36, of types, edge configuration and thickness indicated; in maximum lengths available to minimize end-to-end butt joints.

1. Type: Regular, except where otherwise indicated.

2. Edges Tapered.

3. Thickness: 5/8", except where otherwise indicated on the Delivery order.

2.03 TRIM ACCESSORIES:

A. General: Provide manufacturer's standard trim accessories of types indicated for drywall work, formed of galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for nailing or stapling, and beaded for concealment of flanges in joint compound. Provide corner beads, L-type edge trimbeads, U-type edge trim-beads, special L-kerf-type edge trimbeads, and one-piece control joint beads.

1. Semi-Finishing Type: Manufacturer's standard trim units which are not to be finished with joint compound (non-beaded).

2.04 JOINT TREATMENT MATERIALS:

A. General: ASTM C 475; type recommended by the manufacturer for the application indicated, except as otherwise indicated.

B. Joint Tape: Paper reinforcing type.

C. Joint Compound: Ready-mixed vinyl-type for interior use.

1. Grade: A single multi-purpose grade, for entire application.

2. Grade: 2 separate grades; one specifically for bedding tapes and filling depressions, and one for topping and sanding.

D. Joint Compound: On interior work provide chemical-hardening-type for bedding and filling, ready-mixed vinyl-type or vinyl-type powder type for topping.

2.05 MISCELLANEOUS MATERIALS:

A. General: Provide auxiliary materials for gypsum drywall work of the type and grade recommended by the manufacturer of the gypsum board.

B. Fastening Adhesive (for Wood): ASTM C 557.

C. Gypsum Board Screws: Comply with ASTM C 646.

D. Gypsum Board Nails: Comply with ASTM C 514.

E. Acoustical Sealant: Non-drying, non-hardening, non-skinning, non-staining type, non-bleeding, gunnable sealant for concealed applications per ASTM C 919.

F. Exposed Acoustical Sealant: Non-oxidizing, skinnable, paintable, gunnable sealant for exposed applications per ASTM C 919.

G. Sound Attenuation Blankets: FS HH-I-521, Type I; semi-rigid unfaced mineral fiber blanket insulation produced by combining mineral fibers with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing); Class 25 flame-spread, thicknesses as indicated.

1. Mineral Fiber Type: Fibers manufactured from glass.

H. Polyethylene Vapor Retarder: A single polyethylene film, 4.0 mils thick, with a vapor rating of 0.20 perms per ASTM E 96.

PART 3 - EXECUTION

3.01 INSTALLATION OF METAL SUPPORT SYSTEMS:

A. General:

1. Metal Support Installation Standard: Comply with ASTM C 754.

2. Do not bridge building expansion joints with support system, frame both sides of joints with furring and other support as indicated.

3. Nail or screw furring members to wood framing as indicated.

B. Wall/Partition Support Systems:

1. Install supplementary framing, blocking and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar work to comply with details indicated or if not otherwise indicated, to comply with applicable published recommendations of gypsum board manufacturer, or if not available, of "Gypsum Construction Handbook" published by United States Gypsum Co.

2. Isolate stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.

3. Install runner tracks at floors, ceilings and structural walls and columns where gypsum drywall stud system, abuts other work, except as other-wise indicated.

4. Terminate partition stud system at ceilings, except where indicated to be extended to structural support or substrate above.

5. Space studs 16" o.c., except as otherwise indicated.

6. Frame door openings to comply with details indicated or if not otherwise indicated, to comply with applicable published recommendations of gypsum board manufacturer, or if not available, of "Gypsum Construction Handbook" published by United States Gypsum Co. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track sections (for jack studs) at head and secure to jamb studs.

    a. Extend vertical jamb studs through suspended ceilings and attach to underside of floor or roof structure above, unless otherwise indicated.

7. Frame openings other than door openings to comply with details indicated or if not indicated, in same manner as required for door openings; and install framing below sills of openings to match framing required above door heads.

8. Space wall furring members 16" o.c., except as otherwise indicated.

9. Install polyethylene vapor retarder on interior of framing members of exterior insulated walls to comply with ASTM C 755 and with written directions of vapor retarder manufacturer. Seal joints by lapping and bonding with adhesive or vapor retarder tape. Extend coverage to extremities of areas to receive retarders. Seal punctures, tears and penetrations through retarders with vapor retarder tape or strips of vapor retarder material adhesively applied.

3.02 GENERAL GYPSUM BOARD INSTALLATION REQUIREMENTS:

A. Gypsum Board Application and Finishing Standards: ASTM C 840 and GA 216.

B. Install sound attenuation blankets as indicated, prior to gypsum board unless readily installed after board has been installed.

C. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 1'-0" in alternate courses of board.

D. Install wall/partition boards vertically to avoid end-butt joints wherever possible. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs.

E. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16" open space between boards. Do not force into place.

F. Locate either edge or end joints over supports, except in horizontal applications or where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.

G. Attach gypsum board to supplementary framing and blocking as provided for additional support at openings and cutouts.

H. Form, control joints and expansion joints with space between edges of boards, prepared to receive trim accessories.

I. Cover both faces of steel stud partition framing with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls which are braced internally.

1. Except where concealed application is required for sound, fire, air or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. area, and may be limited to not less than 75% of full coverage.

J. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4" to 1/2" space and trim, edge with J-type semi-finishing edge trim,. Seal joints with acoustical sealant. Do not fasten drywall directly to stud system runner tracks.

K. Where sound-rated drywall work is indicated (STC rating), including double-layer work and work on resilient furring, seal the work at perimeters, control and expansion joints, openings and penetrations with a continuous bead of acoustical sealant including a bead at both faces of partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of beads, and close off sound-flanking paths around or through the work, including sealing of partitions above acoustical ceilings.

1. For double-layer partition systems, work above acoustical ceilings may be installed with base layer only.

L. Space fasteners in gypsum boards in accordance with referenced standards and manufacturer's recommendations, except as otherwise indicated.

3.03 METHODS OF GYPSUM DRYWALL APPLICATION:

A. Single-Layer Application: Install gypsum wallboard.

1. On partitions/walls apply gypsum board vertically (parallel), unless otherwise indicated, and provide sheet lengths which will minimize end joints.

2. On partitions/walls 8'-l" or less in height apply gypsum board horizontally (perpendicular); use maximum length sheets possible to minimize end joints.

B. Single-Layer Fastening Methods: Apply gypsum boards to supports as follows:

1. Fasten with screws.

2. Fasten to wood supports with adhesive and supplementary nails or screws.

C. Direct-Bonding to Substrate: Where gypsum board is indicated to be directly adhered to a substrate (other than studs, joists, furring members or base layer of gypsum board), comply with gypsum board manufacturer's recommendations, and temporarily brace or fasten gypsum board until fastening adhesive has set.

3.04 INSTALLATION OF DRYWALL TRIM ACCESSORIES:

A. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges by nailing or stapling in accordance with manufacturer's instructions and recommendations.

B. Install metal corner beads at external corners of drywall work.

C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed, and except where plastic trim is indicated. Provide type with face flange to receive joint compound except where semi-finishing type is indicated. Install L-type trim where work is tightly abutted to other work, and install special kerf-type where other work is kerfed to receive long leg of L-type trim. Install U-type trim where edge is exposed, revealed, gasketed,or sealant-filled (including expansion joints).

3.05 FINISHING OF DRYWALL:

A. General: Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration. Prefill open joints and rounded or beveled edges, if any, using type of compound recommended by manufacturer.

1. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.

2. Apply joint compound in 3 coats (not including prefill of openings in base), and sand between last 2 coats and after last coat.

3.06 PROTECTION OF WORK:

A. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures gypsum drywall work being without damage or deterioration at time of substantial completion.

END OF SECTION 09250

SECTION 09510 - ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Furnish and install new suspended acoustical ceiling system or extend existing suspended acoustical ceiling as required by the Delivery Order using materials and methods specified herein.

B. Remove the acoustical tile units from the existing suspended acoustical ceiling system furnish and install new acoustical panels as required by the Delivery Order using materials and methods specified herein.

C. Install Government furnished concealed spline type acoustical tile system and fiberglass acoustical ceiling panels as required by the Delivery Order using materials and methods specified herein.

1.02 QUALITY ASSURANCE:

A. Installer Qualifications: Finn with not less than 3 years of successful experience in installation of acoustical ceilings similar to requirements for this project and which is acceptable to manufacturer of acoustical units, as shown by current written statement from manufacturer.

B. Fire Performance Characteristics: Provide acoustical ceiling components that re identical to those tested for the following fire performance characteristics, according to ASTM test method indicated, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate marking of applicable testing and inspecting agency.

C. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other work supported by or penetrating through, ceilings, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition system (if any).

1.03 SUBMITTALS:

A. Product Data: Manufacturer's product specifications and installation instructions for each acoustical ceiling material required, and for each suspension system, including certified laboratory test reports and other data as required to show compliance with these specifications.

1.04 DELIVERY, STORAGE AND HANDLING:

A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sun-light, surface contamination or other causes.

B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

1.05 PROJECT CONDITIONS:

A. Space Enclosure: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

PART 2 - PRODUCTS

2.01 ACOUSTICAL CEILING UNITS, GENERAL:

A. Standard for Acoustical Ceiling Units: Provide manufacturer's standard units of configuration indicated which are prepared for mounting method designated and which comply with SS-S-118 requirements, including those indicated by reference to type, form, pattern, grade (NCR or NIC as applicable), light reflectance coefficient (LR), edge detail, and joint detail (if any).

1. Mounting Method for Measuring NRC: No. 7 mechanically mounted on special metal support, FS SS-S-118; or Type E-400 mounting as per ASTM E 795.

B. Sound Attenuation Performance: Provide acoustical ceiling units with ratings for ceiling sound transmission class (STC) of range indicated as determined according to AMA I-II "Ceiling Sound Transmission Test by Two-Room Method" with ceilings continuous at partitions and supported by a metal suspension system, of type appropriate for ceiling unit of configuration indicated (concealed for tile, exposed for panels).

C. Colors, Textures, and Patterns: Provide products to match appearance characteristics indicated or, if not otherwise indicated, as selected by the Contracting Officer from manufacturer's standard colors, surface textures, and patterns available for acoustical ceiling units and exposed metal suspension system members of quality designated.

2.02 ACOUSTICAL PANELS:

A. Acoustical panels shall be a standard product of the manufacturer and shall be designed for use with background noise systems mounted above the ceiling. The acoustical panels shall have a Noise Reduction Coefficient (NRC) of 20 and flame spread index from 0 to 25. The acoustical panels shall fit into the existing suspension system. The exposed surface of the acoustical panels shall be white or off-white.

2.03 ACOUSTICAL TILES:

A. General: Acoustical tile units for new ceilings shall be mineral fiber, fissured with flame spread index from 0 to 25 (Class A incombustible units), UL labeled when fire rated units are required, light reflectance not less that 0.75, and a NRC of 0.50-0.65 for suspended ceiling. New acoustical tile units shall have standard white factory finish. Acoustical tile units for extending existing ceiling systems shall match the existing acoustical tile units and shall have a flame spread index from 0 to 25. All acoustical tile units shall fit the suspension system, grid pattern and shall be 5/8 inches minimum thickness. Size and type of suspension system to be as noted on Delivery Order.

PART 3 - EXECUTION

3.01 PREPARATION:

A. Coordination: Furnish layouts for inserts, clips, or other supports required to be installed by other trades for support of acoustical ceilings.

B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans wherever possible.

3.02 INSTALLATION:

A. General: Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire resistance rating requirements as indicated, and industry standards applicable to work.

B. Arrange acoustical units and orient directionally-patterned units (if any) to match existing system.

C. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations. Adjust suspension system or panel size as required to permit ready panel removal without damage to panel or suspension system.

3.03 ADJUST AND CLEAN:

A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work, which cannot be successfully cleaned, and repaired to permanently eliminate evidence of damage.

END OF SECTION 09510

SECTION 09520 - ACOUSTICAL WALL SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

A. Extent of acoustical system work is indicated on work order.

1.2 QUALITY ASSURANCE:

A. Fire Performance Characteristics: Provide demountable wall panels, with surface-burning characteristics as indicated below, which have been determined by testing assemblies of identical materials and construction according to ASTM E 84 by a testing organization acceptable to the Contracting Officer.

1. Flame Spread: 25 or less.

1.3 SUBMITTALS:

A. Product Data: Submit manufacturers material specifications and installation instructions. Include instructions for handling, storage, protection, and maintenance.

1. Submit test data from an independent testing agency, acceptable to the Contracting Officer, evidencing that panel assemblies comply with requirements indicated for fire performance characteristics.

B. Samples: Provide 12" x 12" samples of acoustical wall units,complete standard color sample kit, and representative samples of installation devices.

1.4 PRODUCT HANDLING:

A. Protect acoustical units from excessive moisture in shipment, storage, and handling. Deliver in unopened, labeled, bundles and store in a dry place with adequate air circulation. Do not deliver material to building until "wet work" such as concrete and plaster have been completed and cured to a condition of equilibrium. Material delivered in unlabeled packaging will not be accepted.

1.5 PROJECT CONDITIONS:

A. Do not begin installation until spaces to receive acoustical wall panels have been enclosed and maintained at approximately same humidity and temperature conditions as planned for occupancy. Maintain temperature and humidity as recommended by manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Furnish and install acoustic wall panels to match the existing building's standard.

1. Panel Width: 48".

2. Panel Height: As indicated, fabricated from 10'-0" high units.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Install acoustical wall system plumb, in proper alignment and in strict accord with manufacturer's instructions. Arrange units symmetrically on each wall, unless otherwise indicated.

B. Remove and replace panels which are damaged and are unacceptable to the Contracting Officer.

C. Provide mounting accessories to match existing.

3.2 EXTRA STOCK:

A. Deliver stock of maintenance material to the Government. Furnish maintenance material matching products installed, packaged with protective covering for storage and identified with appropriate labels.

END OF SECTION 09520

Section 09650 – RESILIENT FLOORING

The General Conditions, Supplementary Conditions and Division 1 General Requirements are hereby made a part of this Section as fully as if repeated herein.

PART 1 - GENERAL

1.01 SUMMARY

A. Extent of resilient flooring and accessories is shown on the Delivery order.

B. Section Includes: Resilient flooring work as shown on the Drawings or specified herein including installation accessories. Such work includes but is not limited to the following:
   1. All resilient flooring materials including resilient base [required for other floor finishes].
   2. Resilient base at toe spaces and sides of casework and equipment.

1.02 SUBMITTALS

A. Comply with requirements of Shop Drawings, Product Data and Samples Section. Include documentation of pre-consumer and post-consumer recycled content and MSDS with VOC content for each product.

B. Samples: Submit for selection and/or approval of color, pattern, and finish of each type of flooring, base, stair tread and accessory. Installation products shall be submitted upon request of Contracting Officer.
   1. Full size tile samples.
   2. 6" x 9" samples of sheet flooring.
   3. 30" long samples of resilient flooring accessories.
   4. Welding beads for sheet flooring.
   5. Other materials as requested.

C. Maintenance Instructions: Submit 2 copies of manufacturer's recommended maintenance practices for each type of resilient flooring and accessory required.

1.03 QUALITY ASSURANCE

A. All materials shall be 100 per cent asbestos free.

B. Adhesive products and installation shall comply with requirements of all applicable local, regional, state and Federal requirements, and requirements set forth in “2.01 Materials,” below.

C. Installer's Qualifications: Engage a specialist who is certified in writing by resilient flooring manufacturer as qualified for installation of sheet vinyl employing heat welded seams.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in original, unopened containers bearing manufacturer's brand name.

B. Flooring material in any one room or area shall be from one manufacturer's run. Cartons shall be clearly marked with run number.

C. Store materials at the job site at a minimum temperature of 65°F. for not less than 48 hours before installation.

1.05 ENVIRONMENTAL CONDITIONS

A. Maintain rooms and areas to receive flooring and base at a minimum temperature of 65°F. for not less than 48 hours before, during, and 48 hours after installation. Thereafter, temperatures shall be maintained at not less than 55°F.

1.06 PROTECTION

A. Provide such protection as is required to protect the installation from damage until acceptance of the Project. Paper protection, where used, shall be undyed and untreated. Remove such protection immediately prior to acceptance.

PART 2 – PRODUCTS

2.01 RESILIENT FLOORING COLORS AND PATTERNS:

A. Provide color and patterns as indicated by the Delivery Order, or if not otherwise indicated, as selected by Contracting Officer from manufacturer's standards.

2.02 RESILIENT FLOORING:

A. Vinyl Composition Tile (VCT): FS SS-T-312, Type IV; 12" x 12" unless otherwise indicated, and as follows:
1. Composition 1 - asbestos-free.
2. Gauge: 1/8".

B. True Linoleum sheet flooring: Consisting primarily of linseed oil, natural resins, wood or cork flour, limestone and pigments with a jute backing; 1/8” thick. Product shall be completely biodegradable. Acceptable manufacturers: Azrock commercial Flooring, Florence, AL (800/558-2240); Forbo Industries, Inc., Hazleton, PA (717/459-0771); DLW Gerbert, Ltd., Lancaster, PA (717/299-5083).

C. True Linoleum Tile: Consisting primarily of linseed oil, natural resins, wood or cork flour, limestone and pigments with a fiberglass backing; 1/8” thick. Acceptable manufacturers: Azrock commercial Flooring, Florence, AL (800/558-2240); Forbo Industries, Inc., Hazleton, PA (717/459-0771); DLW Gerbert, Ltd., Lancaster, PA (717/299-5083).

D. Natural Cork flooring; 100% total recycled content consisting of 100% post-industrial recycled material. Product shall be completely biodegradable. Acceptable manufacturers: Dodge-Regupol, Lancaster, PA (800/322-1923); Ipocork, Kennesaw, GA (800/828-2675); or approved equal.

E. Rubber Sheet Flooring; 100% total recycled content consisting of 100% post-consumer recycled material; [1/4”] [3/8”] [1/2”] thick. Acceptable manufacturers: Dodge-Regupol, Lancaster, PA (800/322-1923); no known equal.

F. Rubber Tile: 100% total recycled content consisting of 100% post-consumer recycled material; 1/4” thick. Acceptable manufacturers: Dodge-Regupol, Lancaster, PA (800/322-1923); El Dorado Velvet Tile, San Leandro, CA (510/357-6140).

G. Vinyl Safety Flooring, tile or sheet; 100% total recycled content consisting of 100% post-industrial recycled material; [1/8”] [1/4”] thick. Acceptable manufacturers: “Protect Oscoda Plastics, Oscoda, MI (800/544-9538). No known equal.

H. Recycled Plastic Tiles: 80% total recycled PVC consisting of 80% post-consumer recycled material. Acceptable manufacturers: Turtle Plastics, Cleveland, OH (216/791-2100).

2.03 ACCESSORIES:

A. Vinyl Wall Base: Provide vinyl base complying with FS SS-W-40, Type II, with matching end stops and preformed or molded corner units, and as follows:
1. Height: 4".
2. Thickness: 1/8" gauge.
3. Style: Standard top-set cove.
4. Finish: Matte.
5. Color: As selected by the Contracting Officer.

B. Stair Treads - Rubber: Square nose, 3/16" thick tapering to 9/64", raised circle design; R.C. Musson No. 800, or equal, standard colors as selected. Provide matching coved riser and raised circle design landing material.

C. Edge Strips: Solid vinyl tapered tile reducers, 1" nom. width, butt edge to match flooring thickness, standard color as selected.

E. Adhesives and Primers: Solvent free adhesives; confirm compatibility with flooring with manufacturer; VOC content not to exceed 50 gms/l. Acceptable manufacturers: Chicago Adhesive Products Co., Chicago, IL (800/621-0220); Roberts Company, City of Industry, CA; W.F. Taylor Co., Inc., Fontana, CA (800/397-4583); XL Corporation, Calhoun, GA (706/625-0025).

F. Crack Filler and Leveling Compound: Latex type as recommended by flooring manufacturer.

G. Floor Cleaner: As recommended by flooring manufacturer.

H. Substrates
1. Formaldehyde free particle board: Medite Corporation, Medford, OR, (800 676-3339).
2. Oriented strand board, generic.
3. Gypsum fiber board underlayment: 15% total recycled content consisting of 15% post-consumer newspaper. Product: “Fiberbond Underlayment” by Louisiana-Pacific Corporation, Portland, OR (800 547-6331). No known equal.
4. Cork: 100% total recycled content consisting of 100% post-industrial recycled material. Dodge-Regupol, Lancaster, PA (800/322-1923).
5. Cement fiber board: Portland cement, sand, recycled cellulose. James Hardie Building Products, Mission Viejo, CA (800 348-1811) or equal.
6. Gypcrete.

PART 3 - EXECUTION

3.01 CONDITION OF SURFACES

A. Do not commence installation until work of other trades within the area has been substantially completed.

B. Verify that backing surfaces are clean, smooth, plane, and free of grease, oil, construction films, other coatings, or stains. Concrete floors shall be dry with a smooth steel troweled finish within tolerances set forth in Concrete Finishes Section.

C. Test for dryness of subfloor using tests recommended by the flooring manufacturer.

D. Commencing installation implies acceptance of surfaces.

3.02 PREPARATION

A. Properly prepare concrete surfaces to receive resilient flooring materials.

B. Where required by existing conditions, level and/or surface concrete using latex leveling compound in accord with manufacturer's directions.

C. Fill cracks, minor holes, crevices, and depressions with crack filler.

3.03 INSTALLATION- GENERAL

A. Follow manufacturer's specifications and recommendations for all installations.

B. Adhesive: Spread adhesive uniformly and at coverage rate recommended by flooring manufacturer. Use notched steel trowel or other devices as may be specified by manufacturers of adhesive and flooring. Apply adhesive to areas only to the extent which can be covered with flooring within the recommended "tack" time of the adhesive.

C. Flooring:
1. Where tile has a predominate pattern direction, lay in direction determined by the Contracting Officer.
2. Start tile installation in center of each room or area with layout to avoid tiles of less than l/2 size except at irregularly shaped areas.
3. Make joints tightly butted, straight, and aligned square with the room axis. Neatly trim material abutting other work to form a true, clean joint. Where flooring edges are covered by other materials, make cuts sufficiently accurate so that edges are completely concealed.
4. Thoroughly bond resilient flooring to backing surfaces. Blisters and fishmouths are not acceptable.
5. Do not install any material exhibiting abnormal blotches or spots of accenting color.
6. Resilient flooring is not required under fixed, floor mounted casework, and equipment having integral bottoms.

D. Edge Strips: Provide edge strips wherever flooring terminates with an unprotected edge. Fasten resilient strips with adhesive, top edge flush with and tightly butted to flooring.

E. Base: Complete flooring before installation of any base. Install carpet base before laying of carpet. Thoroughly bond base to wall with bottom edge in uniform contact with floor surface. Make joints tight and surfaces aligned. In general, use no pieces of base less than 12" in length. Use pre-molded shapes for external corners. Cope internal corners. Scribe base to abutting materials.

F. Stair Treads: Treads shall be in single pieces full width and depth where possible. Where depth of stair tread exceeds maximum available material, provide matching fillers. Where

stair width exceeds maximum tread length, break joints in adjacent treads and align in alternate treads. Scribe treads and risers to abutting surfaces and thoroughly bond to backing with adhesive. Tread nosings shall be bonded to risers.

3.04 INSTALLATION OF TILE FLOORS:

A. Lay tile from center marks established with principal walls, discounting minor offsets, so that tile at opposite edges of room area of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room, axis, unless otherwise shown.

B. Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged if so numbered. Cut tile neatly around all fixtures. Broken, cracked, chipped, or deformed tiles are not acceptable.

C. Adhere tile flooring to substrate using full spread of adhesive applied in compliance with flooring manufacturer's directions.

3.05 INSTALLATION OF ACCESSORIES:

A. Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with preformed corner units, or fabricated from base materials with mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.
   1. On masonry surfaces, or other similar irregular substrate, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.

B. Place resilient edge strips tightly butted to flooring and secure with adhesive. Install edging strips at edges of flooring which would otherwise be exposed.

C. Apply overlap metal edge strips where shown on drawings, and after flooring installation. Secure units to substrate with countersunk stainless steel anchors, complying with edge strip manufacturer's recommendations.

D. Apply butt type metal edge strips where shown on drawings, and before installation of resilient flooring. Secure units to substrate with countersunk stainless steel anchors complying with manufacturer's recommendations.

3.06 CLEANING AND PROTECTION:

A. Perform following operations immediately upon completion of resilient flooring:
   1. Sweep or vacuum floor thoroughly.
   2. Do not wash floor until time period recommended by resilient flooring manufacturer has elapsed to allow resilient flooring to become well-sealed in adhesive.
   3. Damp-mop floor being careful to remove black marks and excessive soil.
   4. Remove any excess adhesive or other surface blemishes, using appropriate cleaner recommended by resilient flooring manufacturers.

B. Protect flooring against damage during construction period to comply with resilient flooring manufacturer's directions.

3.07 WASTE MANAGEMENT

A. Conform with Section 01505 “Construction Waste Management.”

B. Separate the following materials and place in designated areas for re-use:
   1. Sheet materials larger than 2 square feet.
   2. Tiles larger than or equal to 1/2 tiles.

C. Scraps of Linoleum (with jute backing) and cork too small for reuse may be shredded and composted.

D. Close and seal tightly all partly used adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

E. Place used adhesive tubes and containers in areas designated for hazardous materials.

F. Separate metal waste, cardboard, packaging and all other materials in accordance with the Waste Management Plan and place in designated areas for recycling or reuse.

End of Section

SECTION 09680 - CARPET

The General Conditions, Supplementary Conditions and Division 1 General Requirements are hereby made a part of this section as fully as if repeated herein.

PART 1: GENERAL

1.01 DESCRIPTION OF WORK:

A. Extent of each type of carpeting is indicated on the delivery order, finish schedule and by specifications, and is defined to include carpet, cushion and accessories.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's complete technical product data for each type of carpet, cushion and accessory item required by the delivery order to Contracting Officer.
   1. Maintenance Recommendations: Prior to final acceptance of carpet installation, provide carpet manufacturer's detailed maintenance recommendations for care, cleaning and repair of carpets installed. These instructions shall include recommendations for commercial cleaning, spot cleaning, and vacuum cleaning for each carpeting selected.
   2. Provide manufacturer’s printed literature describing construction and performance of each carpet and pad including longevity and warranties.

B. Shop Drawings: Show dimensioned scale layout for each area to receive carpet. Indicate widths, pile direction for all pieces, seam locations and fill strips (if required). Where carpet has a pattern, stripe or other predominate directional characteristic, show orientation on diagrams including any changes in direction. Where installation requires different colors or patterns for adjoining carpet (such as borders), show layout, dimensions, orientation of pieces and special seaming requirements such as miters. Seaming diagrams shall take into consideration the width(s) of the carpet, consistent direction of pile, future replacement (such as large open areas and traffic paths), seams in relation to door openings, strategic location of seams rather than economy of carpet quantity and relationship of seams to seams/joints in underlay or cushion (where required).

C. Installation Details and Seaming Methods: Show type of installation, tackless strips, location and type and color of edge strips. Show threshold conditions including provisions for terminating carpet at adjoining floor finishes. Indicate the precise seaming methods and techniques proposed along with carpet manufacturer's written recommendations for same.
   1. Tackless strips: Submit method of attachment to Government for review prior to installation.

D. Seaming diagrams, installation details and seaming methods shall be approved by the Government before any carpet is ordered. Upon approval, Subcontractor shall be responsible for ensuring that the prescribed approach is adhered to.

E. Samples:
   1. Carpet: Submit duplicate samples of each type, color and pattern of carpet required to be furnished under the Subcontract, each approximately 12" x 18" *for roll goods; one complete tile for carpet tile products.*
   2. Edge Trim: Submit duplicate samples showing profile and finish, each sample not less than 6" long.

F. Maintenance Recommendations: Prior to acceptance of the Project, furnish to Government two (2) printed copies of manufacturer's recommendations for care, cleaning and maintenance, *including patching procedures,* of each type of carpet furnished.

G. Tests and Certifications:
1. Certificate of Compliance: Provide manufacturer's certificate of compliance stating each material delivered conforms to specifications.
2. Carpet and Rug Institute (CRI) Green Tag consumer information label.

H. Manufacturer’s data on adhesive, including MSDS and VOC content.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: Specialist with not less than 3 years of experience in installation of commercial carpeting of type, quantity and installation methods similar to work of this section.

B. Manufacturer Qualifications: Firm (carpet mill) with not less than 3 years of production experience with carpet similar to types specified in this section; and whose published product literature clearly indicates general compliance of products with requirements of this section.

C. General Terminology Information Standard: Refer to current edition of "Carpet Specifier's Handbook" by The Carpet and Rug Institute; for definitions of terminology not otherwise defined herein, and for general recommendations and information.

D. Flame Smoke Resistance Standards: Where ratings are indicated for carpet or for carpet-plus-pad installations, provide materials complying with ratings as indicated for the following standards:
1. Tunnel Test: Test for surface burning characteristics, with ratings for flame spread, fuel contribution, and/or smoke density; ASTM E 84, UL 723, or NFPA No. 255.
2. Floor Radiant Panel Test: Test for burning under varying radiant energy levels; ASTM E 648, with minimum average radiant flux ratings not less than the following:
a. FRPT Rating: NFPA 101 Class I (min. 0.45 watts/sq. cm.).
3. Smoke Density Test: Test in radiant heat chamber, with and without flame, for density of smoke generated; ASTM E 662, or NFPA No. 258, also known as NBS Smoke Density Chamber Test. Specific optical density shall not exceed 450.
4. Flammability Rating: Pass methanamine pill test DOC-FF-1-70.

E. Fade resistance: Where a fade resistance factor is indicated for carpet or carpet materials, provide materials which have been tested by AATCC Test method 16E, for a maximum grey scale factor of 4 when tested for a period of 40 hours except as otherwise indicated.

F. Density Factor (Pile-Type Carpet): Except as otherwise specified where a density factor is indicated, determine factor by FHA method to indicate measured pile weight in oz. per sq. yd., multiplied by 36, and divided by measured pile thickness (height); ASTM D 418 for measurements.

G. Static Resistance: Provide yarn or yarn blend as indicated in carpet construction, and include provisions to comply with static resistance ratings as indicated, either by selection of yarns known to be effective or by inclusion of small percentages of special anti-static yarn known to be effective in achieving indicated static resistance. Where rating is not

otherwise indicated, provide 2.5 KV resistance for 20% R.H. at 70°F (21 deg.C), AATCC 134.

H. Adhesive materials and installation shall comply *at a minimum* with requirements of Bay Area Air Quality Management District and all other applicable local, regional, state and Federal regulations.

1.04 DELIVERY AND STORAGE

A. Deliver carpeting materials in original mill protective wrapping with mill register numbers and tags attached. Store inside, in well-ventilated area, protected from, weather, moisture and soiling as directed by the Contracting Officer.

B. Store carpet at the job site in a dry, secure and properly heated area for protection from warping, shrinking, stretching, wetting, discoloration or theft. *Do not store carpet near materials that may off gas, or near solvents, kerosene heaters, etc. Store unrolled/unpackaged carpet off site in well-ventilated area for as long as possible to allow venting of fumes; a minimum of 30 days is recommended.*

1.05 SITE CONDITIONS

A. Field verify all dimensions.

B. Do not commence carpet installation until painting and finishing work is complete and ceiling and other overhead work has been tested, approved and completed, unless specifically approved.

C. Maintain room temperature at minimum 60 degrees F for at least 48 hours prior to, during and after carpet installation; relative humidity shall be approximately that at which the area is to be maintained.

D. Schedule, receive and place carpet on floors indicated; protect from soiling or damage during transit, storage, and installation.

1.06 WARRANTY

A. Provide manufacturer's warranty for each Carpet Type.

B. Provide for promptly repairing or replacing, at no cost to Government, carpet which exhibits evidence of defective materials or workmanship.

C. Repairs: Make repairs within ten days of Government's written notification.

D. Warranty Period: Carpet Type 1: [___] years.
Carpet Type 2: [___] years.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS *[CHOOSE FROM THE FOLLOWING PRODUCT GROUPS]*

A. Atlas Carpet Mills, Inc., Bentley Mills, Inc., Patrick Carpet Mills, or equal, each to modify the products of the other as required to comply with the requirements of this Section. The products of Atlas Carpet Mills are specified.

1. CARPET TYPE I: Integral cushion [roll goods] [carpet tiles], as manufactured by Collins and Aikman Floorcoverings, (706/259-9711); Interface Flooring Systems, La Grange, Georgia (770/437-6800); or equal.
   a. Local Representatives: Collins and Aikman: Cathy Tritton, (800/241-4902, ext.1659); Interface: Mark Iberri, (800/336-0225, ext 1705).

2. CARPET TYPE II: Recycled content, ActionBac roll goods as manufactured by Image Carpets, Armuchee, GA (800/722-2504); Talisman Mills, Mequon, WI (800/482-5466) or equal. [Note to specifier: These carpets may meet goals for recycled content but may not meet goals for longevity or reducing VOC content. These carpets are recommended by manufacturers for residential application and therefore should be used in light duty areas.]
   a. Local Representative: Image Carpets; direct to factory only, (800/722-2504); Talisman Mills: direct to factory only (800/482-5466).

2.02 MATERIALS

A. Carpet: *Select among the following, filling in color number and name.*
   1. Carpet Type 1: OXFORD PLACE, Color XXXX, "XXXX".
      a. Type: Level loop.
      b. Yarn: Dupont Antron Legacy.
      c. Face Weight: 26 oz.
      d. Total Weight: 56 oz.
      e. Primary Backing: Polypropylene.
      f. Secondary Backing: ActionBak.

   2. Carpet Type 2: MAYFAIR PLACE, Color XXXX, "XXXX".
      a. Type: Dense cut pile.
      b. Yarn: Deltron nylon.
      c. Face Weight: 36 oz.
      d. Total Weight: 66 oz.
      e. Primary Backing: Polypropylene.
      f. Secondary Backing: ActionBak.

   3. Carpet Type 3: POSITANO, Color XXXX, "XXXX".
      a. Type: Dense cut/uncut textured loop.
      b. Yarn: Dupont Antron.
      c. Face Weight: 38 oz.
      d. Total Weight: 68 oz.
      e. Primary Backing: Polypropylene.
      f. Secondary Backing: ActionBak.

   4. Carpet Type 4: TIVOLI, Color XXXX, "XXXX".
      a. Type: Dense cut pile.
      b. Yarn: Monsanto Ultra 3D.
      c. Face Weight: 36 oz.
      d. Total Weight: 72 oz.
      e. Primary Backing: Polypropylene.
      f. Secondary Backing: ActionBak.

B. Rubber Base: Manufactured by Burke, Roppe or equal. Products of Burke are specified. [4"][6"] top set base, color XXX "XXXX".

C. Accessories:

1. Cushions: *Select between the following cushions:*
   a. Cushion (Tacked-down installation): 40 oz. "Princeton" jute/hair commercial cushion, rubberized both sides.
   b. Cushion (Double glued-down installation): Dense cushion suitable for heavy traffic area, as manufactured by Treadmore, or equal.

2. Seaming Accessories: As recommended by carpet manufacturer.
   a. Seaming tape for use at seams [between Carpet Type 1 and Carpet Type 2] shall be 6 inches minimum width.

3. Carpet Strips: Standard tackless type with double row of pins. Pins shall be sufficiently long to penetrate primary backing.
4. Adhesives: As recommended by carpet manufacturer, non-flammable.
5. Crack Filler and Leveling and Ramping Materials: Latex-cement material compatible with carpet adhesive and sealer.
6. Sealer: As recommended by carpet manufacturer and compatible with crack filer and leveling and ramping materials.
7. Edge Strips: Extruded vinyl or rubber color to match base.

2.03 CARPET TYPES (Integral cushion, roll goods, or carpet tiles].

A. Carpet Type 1:
   1. Pattern: To be specified by Contracting Officer
   2. Color: To be specified by Contracting Officer
   3. Carpet Fiber: Continuous filament type Nylon manufactured by DuPont; solution dyed.
   4. Face Weight: Maximum: 20 oz./sq. yd.; minimum: 16 oz./sq. yd.;
   5. Carpet backing: Closed-cell, vinyl cushion backing.
      a. Vinyl: Thermoplastic vinyl composite
      b. Backing system to provide a barrier to moisture penetration.
      c. Recycled Content: 75% minimum.

   6. Total recycled content: Minimum 45% post-consumer.
   7. Seams for roll goods: Chemically welded.
   8. Stain Inhibitor: Stain inhibitor to be applied during manufacture to resist fiber staining and soiling.
   9. Carpet to provide a reduction barrier to radon flow.
   10. Wear Warranty: [15 years] [20 years]

B. Accessory Group I for use with Carpet Type I
   1. Seam sealants for roll goods: Use chemical seam sealants as provided by manufacturer.
      a. Zero VOC if available. Maximum VOC level not to exceed 50 g / l.
      b. The use of seam sealants containing 1,1,1-trichloroethane or toluene is not allowed.

   2. Carpet Adhesive: Product to be installed without the use of wet adhesives. Product to be supplied with pre-applied, dry adhesive.
   3. Carpet Cushion: integral with carpet.
   4. Carpet Edge Guard, Nonmetallic: Heavy-duty extruded- or molded-rubber edge guard with minimum 2-inch-wide anchorage flange.

      a. Color to be selected by the Contracting Officer from standard colors available.

5. Crack Filler and Leveling and Ramping Materials: Latex-cement material compatible with carpet adhesive and sealer.
6. Sealer: As recommended by carpet manufacturer and compatible with crack filer and leveling and ramping materials.

C. Leasing and Buyback Programs: manufacturer to have carpet [leasing] [buyback] [renewal] program for the return of carpet at the end of it's useful life.

D. Carpet Type II: Recycled content, ActionBac roll goods.
1. Pattern: To be specified by Contracting Officer
2. Color: To be specified by Contracting Officer.
3. Carpet Fiber: "Resistron" polyester; skein dyed.
   a. Fiber Source: Recycled Polyethylene Terepyhalate (PET).
   b. Recycled Content: 100% post-consumer.
4. Face Weight: 40 oz. minimum; Total Weight: 76 oz. minimum.
5. Carpet backing:
   a. Primary Backing: 24 x 18 antistatic polypropylene
   b. Secondary Backing: Action Bac
6. Total recycled content: Minimum 52% post-consumer.
7. Seams: chemically welded per manufacturer's specifications.
8. Stain Inhibitor: Factory applied.
9. Wear Warranty: [15 years] [20 years].

E. Accessory Group II for use with Carpet Type II
1. Seam sealants: Use chemical seam sealants as specified by manufacturer.
   a. Zero VOC if available. Maximum VOC level not to exceed 50 g / l.
   b. The use of seam sealants containing 1,1,1-trichloroethane or toluene is not allowed.
2. Carpet Attachment:
   a. Tackless Carpet Stripping: Water-resistant plywood strips 3/8 inch or 9/32 inch thick, as required to match cushion/carpet thickness with angular pins protruding from top for gripping and holding stretched carpet.
   b. Hook and Loop velcro fastening: "Tac Fast" Manufactured by 3M; contact Chuck Hill, Roseville, MN (800/440-2965).
3. Carpet Adhesive: Use only when mechanical fasteners or dry tack adhesives are unavailable. Adhesive shall be approved by carpet manufacturer.
   a. Adhesive shall be water based, low VOC adhesive only, with a maximum VOC content of 50 gms/l.
   b. Manufacturers: Chicago Adhesive Products Co., Chicago, IL (800/621-0220); W.F. Taylor Co., Inc., Fontana, CA (909/360-6677).
4. Carpet Cushion: Recycled textile fiber pads.
   a. Minimum weight density factor: 14 lbs.
   b. Recycled content: 100% post-industrial recycled content.
   c. Manufacturers: Chris Craft Industrial Products, Waterford, NY (518/237-5850); Reliance Carpet Cushion, "non-allergenic," Gardena, CA (800/552-5252); Sutherlin Carpet Mills, "low-toxic", Orange, CA (714/447-0792).

5. Carpet Edge Guard, Nonmetallic: Heavy-duty extruded- or molded-rubber edge guard with minimum 2-inch-wide anchorage flange.
   a. Color to be selected by the Contracting Officer from standard colors available.

6. Crack Filler and Leveling and Ramping Materials: Latex-cement material compatible with carpet adhesive and sealer.
7. Sealer: As recommended by carpet manufacturer and compatible with crack filer and leveling and ramping materials.

PART 3 – EXECUTION

3.01 CONDITION OF SURFACES

A. Do not proceed with carpet installation until wet work is completed and heating system is in operation.

B. Floors shall be smooth, free of projections and depressions, which would telegraph through completed installation, clean and dry.

C. Examine all threshold conditions and conditions at adjoining floor finishes and ensure that provisions have been made for the neat termination of the carpet.

D. Report any defects which would affect the carpet installation. Proceeding with installation implies acceptance of surfaces.

3.02 PREPARATION

A. Clean floors of dust, dirt, solvents, oil, grease, paint, plaster and other substances detrimental to proper performance of carpet; allow floors to thoroughly dry.

B. Ensure floors are level, with maximum surface variation of 1/4" in 10 feet.

C. Ensure concrete floors are free from scaling and irregularities and exhibit neutrality relative to acidity and alkalinity.

D. Use leveling and ramping material to patch cracks, small holes, leveling and for ramping to provide finished carpet within 1/2" of adjacent flooring materials. Remove all projections.

E. Where concrete floors show varying porosity or are excessively dusty or powdery, treat with sealer applied as per sealant manufacturer's directions.

3.03 INSTALLATION

A. Install carpet in accord with manufacturer's directions and the requirements of these specifications. Where specifications conflict with manufacturer's directions, secure directions from Government before proceeding.

B. Check matching of carpet before cutting and ensure there are no visible defects or variations between dye lots.

C. Cut carpet, where required, in manner to allow proper seam and pattern match; ensure cuts are straight, true, and unfrayed.

D. Install carpet as per approved seaming diagrams using continuous lengths and with pile oriented in the same direction unless otherwise shown on diagrams. Unless otherwise indicated, install carpet with pile direction square with axis of room or area. Carpet for corridors and other long and narrow areas shall run with the long dimension of the space without longitudinal seams.

E. Where possible and practical, locate seams in areas of least amount of traffic; no seams shall occur perpendicular to doors or entries; seams parallel to doors shall be centered directly under door.
1. Follow wall line parallel to carpet direction for seams occurring at corridor change of direction.
2. Join seams in recommended manner so as not to detract from appearance of carpet installation and decrease its life expectancy; ensure seams are straight, not overlapped or peaked, and free of gaps.

F. Lay carpet with run of pile in direction of anticipated traffic; do not change run of pile in any one room or from one room to next where continuous through a wall opening.

G. Cut and fit carpet accurately around projections through floor and to walls and other vertical surfaces.

H. Fit carpet snugly to walls or other vertical surfaces where no base is scheduled, leaving no gaps.

I. Accurately match patterns in adjoining pieces of carpet.

J. Where seams are required, cut adjoining edges to fit exactly at every point along seam line. Do not cross seams.

K. Use no fill strips less than 2 feet in width. Fill strips permitted only in inconspicuous areas.

L. Lay installation tight and flat to subfloor, well fastened and uniform in appearance; ensure monolithic color, pattern and texture match within any one area.

M. Secure carpet strips as recommended by strip manufacturer using nails or *low-VOC* adhesive as appropriate. Position strips with pins angled toward wall. Properly place strips from wall (except for thick, very dense carpet, space shall not exceed 1/4").

N. Cushion Installation: Install smooth and flat in largest possible lengths and widths using the least number of pieces. Except in small, light traffic areas, where the least dimension of the room or area is less than the available width of the cushion, the cushion shall be laid in a single piece. Seams in cushion shall not occur in same locations as carpet seams and shall preferable run at right angles to carpet seams. Neatly trim to [*select between the following: for tacked-down installation use:* carpet strips for *glued-down installation use* wall] and secure to substrate using cushion tape, *low-VOC* adhesive or staples as appropriate for substrate and type and thickness of cushion. Stretch cushion to eliminate bubbles and wrinkles. No cushion shall be covered by carpet until the cushion installation is approved by the Government.

O. Seaming: Follow manufacturer's directions and recommendations for sewn seams reinforced with latex and tape. Use at least 3 stitches per inch with a minimum bite of 5/8" from the cut edge. Prior to sewing, seal all seam edges with latex bead to prevent unraveling.

P. Stretch carpet firm and tight using power stretchers, kickers and other mechanical aids as required. [*For glued-down installation uses the following:* Hand stretching is not permitted. Adhere carpet to cushion with adhesive, trim and adhere edge neatly and securely into place at wall.] *[For tacked-down installation use the following:* Adjust pins (teeth) so they do not penetrate secondary back of carpet. Hand stretching is not permitted. Hook carpet to carpet strip pins, trim and tuck edge neatly and securely into space between strip and wall.]

Q. Edging Strips: Install edging strips where carpet terminates at other floor coverings; use full length pieces only, butt tight to vertical surfaces; where splicing cannot be avoided, butt ends tight and flush.

R. Carpet Removal: Return to manufacturer for resurfacing or recycling, or reuse or recycle carpet as outlined in 3.08 “Waste Management” below.

3.04 CARPET REMNANTS

A. Arrange to have Government view carpet scraps and retain any it chooses for future repairs. Package, identify and deliver to Government. *All carpet in good condition and not retained by the Government shall be distributed in one of the following ways:*

1. Return to manufacturer’s recycling program.
2. Delivered to regional re-use/reclamation facility.
3. Natural fiber carpets in amounts too small to reuse shall be composted.

3.05 INDOOR AIR QUALITY

A. Clean old carpet prior to removal.

B. Clean area under old carpet thoroughly.

C. Pre-ventilate carpet. Comply with 1.04.B.

D. Adhesives and seam sealants: avoid if possible. If used comply with section 2.02, C&D.

E. Provide maximum ventilation during installation.

F. Isolate area of installation from rest of building.

G. Clean new carpet thoroughly with a high-efficiency particulate air (HEPA) filtration vacuum.

H. Vacate space for as long as possible after installation.

3.06 CLEANING AND PROTECTION

A. When installation is otherwise complete, clean dirt and debris and clean carpet free of spots, using proper spot remover. Remove loose threads and tufts and vacuum clean using an upright beater type of equipment. Completed installation shall be free of tacks, ripples, wrinkles, grins, scallops, puckers, tears, frayed edges and pulled threads or yarns.

3.07 ADJUSTMENT AND REPAIR

A. Subcontractor shall restretch any carpet and repair any seams or edges, which may be required for a period of one-year following date of acceptance of entire Project.

3.08 WASTE MANAGEMENT

A. Separate waste in accordance with the Waste Management Plan. Set aside and protect offcuts and remainder greater than 1 square yard for reuse by owner or other user.

B. Return scrap to manufacturer for re-use or recycling. For lack of recycling program contact independent recycling programs:

1. Dupont - Partnership for Reclamation: For information contact Dupont Flooring Systems (706 275-7791).

2. BASF 6ix Again: For information contact BASF Corporation (800 652-9964).

C. Close and seal tightly all partly used adhesive containers and store protected in well ventilated, fire-safe area at moderate temperature.

D. Place used adhesive tubes and containers in areas designated for hazardous materials.

E. Return packaging materials including wrappings and tubes to manufacturer or distributor for reuse.

F. Separate metal waste and all other materials in accordance with the Waste Management Plan and place in designated areas for recycling or reuse.

END OF SECTION

SECTION 09900 - PAINTING

The General Conditions, Supplementary Conditions and Division 1 General Requirements are hereby made a part of this section as fully as if repeated herein.

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Furnish and install all labor, material and equipment required to prepare and paint or varnish all surfaces required in the Delivery Order using materials and methods specified herein.

B. Work includes painting and finishing of interior and exterior exposed items and surfaces throughout project, except as otherwise indicated.
   1. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of work.

C. Work includes field painting of exposed bare and covered pipes and ducts (including color coding), and of hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under mechanical and electrical work, except as otherwise indicated.

D. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

E. Surfaces to be Painted: Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces whether or not colors are designated in "schedules". Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, Contracting Officer will select these from standard colors or finishes available.
   1. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

F. Following categories of work are not included:
   1. Vault doors
   2. Interior surfaces of vaults
   3. Murals
   4. Decorated ceilings
   5. Movable furniture
   6. Wood floors
   7. Non-ferrous metal

1.02 SUBMITTALS

A. Materials List: Note that in general, numbers of paint types listed in painting schedule are ***ICI***. Regardless of which brands are used, at least 30 days prior to starting any painting work Subcontractor shall, before submitting samples, submit for Contracting Officer's (CO) approval a complete schedule of manufacturers and products required throughout the work, together with specifications of application recommended by each manufacturer, and special surface preparation procedures and substrate conditions requiring special attention. Include the manufacturer's recommended dry mil thickness for each coat of each scheduled

finish. If no thickness is shown, the specified dry film thickness as scheduled shall apply. ***Include volatile organic compound (VOC) in Grams/ liter if manufacturer or paint system is different from that listed below.*** Product lists shall be arranged in the same format and order as the Painting Schedule hereinafter included in this Section of the Specifications. General approval by CO of such a schedule shall not constitute a waiver of the specification.

B. Certificate: Provide certificate from each manufacturer stating that material is first quality, meets or exceeds the properties of specified materials as specified herein, and is suitable for intended use on this Project.

C. Samples of Colors and Finishes:
1. All colors are to be approved by the Contracting Officer.
2. Preliminary Approval: The Paint subcontractor shall submit to the CO for preliminary approval four (4) sets of 8 in. x 10 in. samples of each color.
3. Final Approval: After 8 in. x 10 in. samples have been approved, apply field samples at locations designated by Contracting Officer for final approval of paint colors and textures. Final colors may be required to vary slightly from approved preliminary colors to satisfy actual field and lighting conditions. No additional cost or change in schedule will be allowed for this. Samples of final finish shall be prepared on the job and shall be entire members or areas painted in place.

D. Submit manufacturer's product data for crack filler, epoxy mortar and bonding agent, to Contracting Officer for approval.

E. Closeout Submittals:
1. Submit three copies of manufacturer's color formula for each final approved color used in the Project. Attach 4" x 6" color chip of final approved colors to each copy.

1.03 QUALITY ASSURANCE

A. Qualifications of Painters: All work shall be done by painters especially skilled and proficient in executing their work by the very best methods for each kind or type. Painting shall only be done when surface is dry and when weather conditions are satisfactory. All materials shall be applied at proper viscosity.

B. Regulatory Requirements: All materials specified in this Section and their applications shall comply ***at a minimum*** with current rules and regulations of all applicable local, regional, state and Federal Air Resources Board and Federal Lead Content Regulations. No chromates or lead will be allowed.

C. Manufacturer's Instructions: All painting work shall be done in accordance with Manufacturer's instructions. The thickness of the finished paint job on any surface shall be equal to or exceed the total dry mil thickness as recommended by the paint manufacturer for the particular paint use, number of coats, method of application and surface to which paint is applied.

D. The Contracting Officer's Inspector will inspect each coat and operation before succeeding coats are applied to determine that the work meets the requirements of specifications in all regards, including uniform color, coverage and texture. He may check completed painted surfaces for dry film thickness as measured by a Tooke's Gauge. Additional coats will be required at no additional cost should uniform color, coverage, and texture not be achieved, or if dry film measurements indicate thickness less than those recommended by the paint manufacturer.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:
   1. Name or title of material.
   2. Fed. Spec. number, if applicable.
   3. Manufacturer's stock number and date of manufacture.
   4. Manufacturer's name.
   5. Contents by volume, for major pigment and vehicle constituents.
   6. Thinning instructions.
   7. Application instructions.
   8. Color name and number.

B. Store materials and equipment at site in properly ventilated areas assigned for this purpose and in accord with manufacturer's instructions. Do receiving, opening, and mixing of paint in this location. Opening and mixing operations shall not take place in areas to receive adhesive applied finishes, deck coatings, waterproofing, or on unprotected exposed slabs.

C. All necessary precautions shall be taken to prevent fire. Rags and waste, soiled with paint, shall be removed from the site at the end of each day's work, or stored in metal containers with tight metal covers.

1.05 PROJECT CONDITIONS

A. Comply with paint manufacturer's recommendations as to environmental conditions under which paint materials and systems can be applied. Apply no materials in areas where dust is being generated or will be generated before coatings are thoroughly dry.
   1. Apply water base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50°F and 90°F, unless otherwise permitted by paint manufacturer's printed instructions.
   2. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45°F and 95°F, unless otherwise permitted by paint manufacturer's printed instructions.

B. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85%, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.
   1. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Approved brands are ***ICI***, Benjamin Moore, Fuller-O'Brien, Sherwin Williams, Dunn-Edwards, and Pratt & Lambert.
   1. Proprietary names used to designate colors are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.

2. Federal Specifications establish minimum acceptable quality for paint materials. Provide written certification from paint manufacturer that materials provided meet or exceed these minimums.
3. Manufacturer's products which comply with coating qualitative requirements of applicable Federal Specifications, yet differ in quantitative requirements, may be considered for use when acceptable to Contracting Officer. Furnish material data and manufacturer's certificate of performance to Contracting Officer for any proposed substitutions.

B. Established Standard: ***ICI*** products or equal products from approved brands listed within Article 2.01A above; ***ICI*** numbers for ***ICI*** products are specified below within Paint Schedule Article, and have been obtained from the latest information available. Should manufacturer's numbers of specifications change, their latest equal or better product shall be substituted. Regardless of substitutions the number of coats required in these specifications shall be applied.

C. Only pure, unadulterated, first quality materials are permitted. When manufacturer makes more than one quality of product, use only its best quality. Undercoats are to be of same manufacturer as approved final coat.

D. Materials left from previous work are not acceptable. If required by the Contracting Officer, the Subcontractor shall furnish proof from the manufacturer that material is of recent manufacture and has been purchased by the Subcontractor for this specific job.

E. Specific products and systems are set forth in the Painting Schedule hereinafter included in this Section.

F. Manufacturer's specifications and recommendations and/or directions for preparation, under coat and final coat application are hereby made a part of this specification. Where conflict occurs which could impair the quality of the work, verify with Contracting Officer for approval of material and application.

G. No thinning, reducing or changing of mix is permitted unless specifically indicated herein.

H. Prepackaged Epoxy Mortar and Bonding Agent: Bonding agent shall be as approved by epoxy mortar manufacturer.

I. Crack Filler: Elastomeric, as approved by paint manufacturer for the particular use intended.

2.02 COLORS

A. Finish coat colors shall be factory mixed; no job "mixing and matching" permitted.

B. Unless specifically noted otherwise, colors will not be changed within a surface plane.

C. Unless otherwise directed by the CO, paint prime coated access panels, grilles, etc., same color as adjacent surfaces, or, if adjacent surface does not require painting, use color as directed.

D. Where items of mechanical or electrical equipment are installed in finished spaces, or are out-of-doors, and where same have been furnished prefinished without benefit of prior selection of color or finish by the Contracting Officer, said items of equipment shall be

etched or otherwise prepared and given one spray coat of compatible finish to cover in color as approved by Contracting Officer.

E. Where ducts and piping are exposed in finished areas, such items will be painted to match wall or ceiling color and will not be color coded or painted in accent colors.

2.03 LIFE OF FILM

A. The color of surfaces finished under this Section shall at the end of one year, (five (5) years for elastomeric and non-slip coatings) remain free from serious fading and the variation, if any, shall be uniform. The original adherence of materials shall be maintained for one (1) year, (five (5) years for non-slip coating and prime coat for exterior concrete and cement plaster ("stucco")), and during this period there shall be no evidence of any blisters, running, peeling, scaling, chalking, streaks or stains. Washing with alkali-free soap and water shall remove surface dirt without producing the above or other deteriorating effects.

PART 3 - EXECUTION

3.01 PROTECTION

A. The painting subcontractor shall take the necessary steps to protect his work and the work of other trades during the time his work is in process and the Subcontractor shall be responsible for any and all damage to the work, or property or other trades, caused by his employees or by himself.

B. Use protective covers or drop cloths to protect floors, fixtures and equipment. Exercise care to prevent paint being spattered onto surfaces which are not to be painted. Surfaces from which such paint cannot be satisfactorily removed shall be painted or repainted, as required to produce finish satisfactory to the Contracting Officer. Use masking tape, if necessary, to protect adjacent surfaces.

C. Hardware, fixture canopies, outlet covers, switch plates, and other similar items shall not be present on surfaces being painted.

3.02 SURFACE CONDITIONS

A. Before starting any work, the Subcontractor shall inspect all surfaces to be painted or finished. He shall notify the Contracting Officer in writing of any unsuitability of surfaces for painting or finishing. The commencing of work, or the absence of the notification in writing, shall be construed as acceptance of the surfaces by Subcontractor. It shall then be the responsibility of the Subcontractor to correct any defects appearing in the painting work thereafter.

3.03 SURFACE PREPARATION

A. General: Surfaces to receive painter's finish shall be thoroughly cleaned of dirt, oil, grease, rust, loose coatings, scaling or chalking paint, mildew, efflorescence, and any other deleterious matter or contamination which would adversely affect adhesion, protective properties or appearance of coatings. It shall be Subcontractor's responsibility to use whatever methods are required in cleaning surfaces, including the use of wire brushing, sanding, burning, scraping, beadblasting, washing, waterblasting, and steam cleaning, to ensure that the paint finish adheres properly and that complete coverage is obtained.

1. Materials resulting from cleaning procedures shall be contained and disposed of in accord with Contracting Officer procedures and applicable code requirements.

B. Manufacturer's Inspection of Surfaces: Prior to painting, surfaces shall be inspected by the paint manufacturer in order to verify the proper surface preparation and primer. If primer other than that specified herein is recommended, it shall be furnished without extra cost to the Contracting Officer. The manufacturer through the Subcontractor shall guarantee that the proposed material is suitable for the purpose.

C. Concrete and Cement Plaster ("Stucco"): Application of paint shall be delayed as long as possible without delaying the completion of the project, but no case shall paint be applied sooner than 30 days after stripping of forms or completion of plastering. Remove oils, grease and acids and stains subject to bleeding through painted finish. Use bristle brushes to remove dirt, dust and mortar stains. All cracks 1/16" wide and larger shall be cleaned out and filled. Patch cracks, holes and imperfections. Brush surfaces free of efflorescence. Test for presence of alkali; where it exists, neutralize for oil base paints. Proprietary neutralizing compounds recommended by paint manufacturer and applied as per their directions are acceptable.

1. Spalled Concrete: Remove spalled concrete to sound material with a hammer. Prime surface of spalled area with bonding agent approved by the manufacturer of the patching material. Patch spalled area with prepackaged epoxy mortar; mix, apply and cure in accord with manufacturer's instructions. Finish to match adjacent surface.

D. Concrete Block: Surfaces shall be free of mortar droppings, voids pointed, dust and laitance removed. Neutralize alkali as specified for concrete surfaces.

E. Metals: Remove mill scale, rust and corrosion. Clean surfaces free of oils, grease and dust using mineral spirits. Touch up chipped or abraded areas in shop coatings using appropriate primer. Wash galvanized metals with *vinegar wash per manufacturer's specification.* Remove all excess etching solution and allow to dry completely before application of paint.

F. Gypsum Wallboard: Surfaces shall be free of loose dust and imperfections in taping and cementing which would "telegraph" on finished painted surfaces. Touch up suction spots after primer-sealer coat is dry.

G. Wood: Remove dirt, dust and mortar stains by brushing, scraping or sanding. Remove oil and grease with mineral spirits. Scrape pitch and sap pockets, wash with mineral spirits and seal knots and pitch streaks with appropriate sealer. Millwork, including doors, shall have handling marks or effects of exposure to moisture removed with thorough, final sanding over exposed surfaces using 150 grit or finer sandpaper and shall then be brushed clean. Deep scratches shall be steamed out before sanding. Sand millwork and brush clean. After primer coat is dry, fill cracks, nail holes and minor surface defects with linseed oil putty or spackling compound, sand smooth and seal with shellac. Sand millwork between coats. Prime or backprime wood items before installing. Prime or seal items of finish carpentry and millwork on all sides immediately upon delivery to project site. Top and bottom edges of doors and all cutouts shall be sealed with two (2) coats of opaque paint. Where items are furnished preprimed, touch up abrasions.

3.04 PAINT APPLICATION

A. Apply material evenly, free of sags, runs, crawls, brush marks, according to manufacturer's directions. Do not apply paint under damp or humid conditions or when temperature is less

than or is likely to fall below 50 degrees. Apply each coat at manufacturer's recommended coverage rates and consistency and so as to achieve minimum dry film thickness. Vary color of successive coats slightly. Allow each coat to dry before succeeding coat is applied. Paint to sharp, true lines and edges. Covering shall be complete. Tint base coats toward finish coat to facilitate coverage. When color, stain, dirt or undercoats show through the final coat of finish, additional finish coats shall be applied until coverage is complete and the finish is of uniform color and appearance.

B. In general, apply all paint by brush or roller. Application of paint shall be by methods approved by Local Joint Labor Committees. The Contracting Officer's approval of spray applications shall be in accordance and subject to Union agreements for sprayable surfaces and types of finishes. Spray applications shall be used for electric panels, fire extinguisher cabinets, smoke detection control cabinets, fire alarm horns, diffusers and similar items for a smooth finished appearance. Where spray application is required or may be permitted, manufacturer's recommended minimum dry film thicknesses for coatings shall be complied with.

C. Verify shop prime coat material and use compatible finish coat material. Use sprayed lacquer finish over lacquered prime coat; etch or otherwise prepare baked enamel prime coat for smooth application of finish coats without brush marks.

D. Avoid lapping paint on adjacent unpainted surfaces.

E. On job finished doors and other parts free to warp, apply sufficient number of coats on opposite sides and edges to preserve balance.

F. Finish top, jamb and bottom edges of doors same as door faces unless otherwise indicated; apply finish to edges after fitting and before faces are finished.

G. Paint metal louvers and glass stops to match color of door faces.

H. Hardware, accessories, fixtures and similar items (except door hinges and prime coated items) installed prior to final painting shall be removed and protected during painting and replaced on completion of painting.

I. Painter's finish is not required on walls in back of permanently fixed casework and equipment with closed backs.

J. Specified prime coat may be omitted on shop primed items except for touch-up.

K. Do not apply painter's finish over polyurethane or silicone type of sealant material or over neoprene expansion joint covers.

L. Enamel and varnish undercoats shall be sanded smooth prior to recoating.

M. Moisture Content: A moisture meter shall be used to determine moisture content of surfaces to be painted. Do not proceed with the painting of wood surfaces until the moisture content of the wood is 12% or less as measured by a moisture meter approved by the Contracting Officer. Do not proceed with painting of new concrete.

N. Spot prime all exposed nails and other metals which are to be painted with emulsion paints, using a primer recommended by the manufacturer of the coating system.

3.05 WORKMANSHIP

A. Subcontractor shall provide temporary lighting for painting work. Do not do any painting work including sealing and priming without adequate lighting (30 foot candles minimum).

B. Where the term "exposed" is used in these specifications, it shall mean all visible surfaces as viewed from the any vantage point on the exterior of the building, and all interior surfaces in the room which can be seen when standing on the floor in that room.

C. The finished work shall show no cloudiness, spotting, holidays, laps, brush marks, runs, curtains, sags, ropiness, or other surface deviations or imperfections not consistent with first class workmanship.

D. Work which shows carelessness, lack of skill in the execution, or which is defective due to any other cause shall be removed and refinished or repainted as directed.

E. Brush strokes or roller marks on final painting of surfaces shall be uniform in direction.

3.06 TRIM AT REVEALS

A. Include painting of interior and exterior metal trim at perimeters of surfaces and where surfaces are divided with such trim.

B. See plans and details for locations, extent and types. Unless otherwise noted, color of reveal shall match adjacent surface.

3.07 PAINTING IN EQUIPMENT ROOMS

A. Do not put drop cloths or other covering over running mechanical or electrical equipment for even a short time without approval from the Contracting Officer.

3.08 INDOOR AIR QUALITY

A. Applicators shall wear protective clothing and respirators when applying paints.

B. Maximize ventilation during application and drying.

C. Isolate area of application from rest of building.

D. Vacate space for as long as possible after application. Wait a minimum of 48 hours before occupying freshly painted rooms.

3.09 CLEANUP

A. During progress of the Work, do not allow the accumulation of empty containers or other excess items except in areas specifically set aside for that purpose.

B. Prevent accidental spilling of paint materials and, in event of such spill, immediately remove all spilled material and the waste or other equipment used to clean up the spill, and wash the surfaces to their original undamaged condition, all at no additional cost to the Contracting Officer.

C. Touch-Up: Prior to acceptance of Project, inspect painted surfaces and touch-up or refinish as required, abraded, stained or disfigured coatings. Costs of such touch-up shall be borne by trade causing the damage.

D. Cleaning: Remove spatters, spots and blemishes caused by work of this Section from surfaces throughout Project.

E. Equipment clean-up: All clean-up shall be conducted with water or water based agents. Do not use mineral based thinners or solvents, either on site or at applicator's shop.

3.10 PAINTING SCHEDULE

A. Provide following paint systems for various substrates, as indicated. Paints shall comply with dry mil thickness where shown. Paints shall not exceed the volatile organic compound (VOC) content shown. Numbers refer to products of ICI:

B. Exterior Work

1. Cement Plaster and Concrete – Flat (This system has 5-year labor & materials warranty).

1st Coat:	2000 Decra-Shield	Dry 1.5 mls.
	Exterior Latex Primer	VOC: 95 g/l
2nd Coat:	2200 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 0 g/l
3rd Coat:	2200 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 0 g/l
	Total Dry Mils	5.1 mls

2. Cement Plaster, Concrete & Brick Masonry - Low Sheen

1st Coat:	2000 Decra-Shield	Dry 1.5 mls
	Exterior Latex Primer	VOC: 95 g/l
2nd Coat:	2402 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 0 g/l
3rd Coat:	2402 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 0 g/l
	Total Dry Mils	5.1 mls

3. Concrete Masonry Units (CMU) - Flat

1st Coat:	4000 Bloxfil	Dry 7.0-14.5 mils
	Acrylic Block Filler	VOC: 67 g/l
2nd Coat:	2000 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 95 g/l
3rd Coat:	2000 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 95 g/l
	Total Dry Mils	10.6 mls

4. Concrete Masonry Units (CMU) - Low Sheen

1st Coat:	4000 Bloxfil	Dry 7.0-14.5 mils
	Acrylic Block Filler	VOC: 67 g/l
2nd Coat:	2402 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 0 g/l
3rd Coat:	2402 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 0 g/l
	Total Dry Mils	10.6 mls

5. Metal, Ferrous - Low Sheen

1st Coat:	4120 Devguard	Dry 1.5-2.0 mils
	Metal primer	VOC: 388 g/l
2nd Coat:	2402 Decra-Shield	Dry 1.8 mls

	100% acrylic paint	VOC: 0 g/l
3rd Coat:	2402 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 0 g/l
	Total Dry Mils	5.1 mls

6. Metal, Ferrous - Semigloss

1st Coat:	4120 Devguard	Dry 1.5-2.0 mils
	Metal primer	VOC: 388 g/l
2nd Coat:	2406 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 229 g/l
3rd Coat:	2406 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 229 g/l
	Total Dry Mils	5.1 mls

7. Metal, Galvanized - Low Sheen

Pretreatment:	vinegar wash per manufactuer	
1st Coat:	4120 Devguard	Dry 1.5-2.0 mils
	Metal Primer	VOC: 388 g/l
2nd Coat:	2402 Decra-Shield	Dry 1.8 mls
	100% Acrylic Paint	VOC: 0 g/l
3rd Coat:	2402 Decra-Shield	Dry 1.8 mls
	100% Acrylic Paint	VOC: 0 g/l
	Total Dry Mils	5.1 mls

8. Metal, Galvanized - Semigloss

Pretreatment:	vinegar wash per manufactuer	
1st Coat:	4120 Devguard	Dry 1.5-2.0 mils
	Metal Primer	VOC: 388 g/l
2nd Coat:	2406 Decra-Shield	Dry 1.8 mls
	100% Acrylic Paint	VOC: 229 g/l
3rd Coat:	2406 Decra-Shield	Dry 1.8 mls
	100% Acrylic Paint	VOC: 229 g/l
	Total Dry Mils	5.1 mls

9. Metal, Aluminum - Low Sheen

1st Coat:	4120 Devguard	Dry 1.5-2.0 mils
	Metal Primer	VOC: 388 g/l
2nd Coat:	2402 Decra-Shield	Dry 1.8 mls
	100% Acrylic Paint	VOC: 0 g/l
3rd Coat:	2402 Decra-Shield	Dry 1.8 mls
	100% Acrylic Paint	VOC: 0 g/l
	Total Dry Mils	5.1 mls

10. Metal, Aluminum - Semigloss

1st Coat:	4120 Devguard	Dry 1.5-2.0 mils
	Metal Primer	VOC: 388 g/l
2nd Coat:	2406 Decra-Shield	Dry 1.8 mls
	100% Acrylic Paint	VOC: 229 g/l
3rd Coat:	2406 Decra-Shield	Dry 1.8 mls
	100% Acrylic Paint	VOC: 229 g/l
	Total Dry Mils	5.1 mls

11. Wood (Except Walking Surfaces) - Flat
1st Coat (For Redwood and Cedar):

	2110 Ultra-Hide Durus	Dry 1.5
	Alkyd Pigmented Primer	VOC: 313 g/l
1st Coat (For all other woods):		
	2000 Decra-Shield	Dry 1.5 mls
	Exterior Latex Primer	-VOC: 95 g/l
2nd Coat:	2200 Decra-Shield	Dry 1.8 mls
	100% Acrylic Paint	VOC: 0 g/l
3rd Coat:	2200 Decra-Shield	Dry 1.8 mls
	100% Acrylic Paint	VOC: 0 g/l
	Total Dry Mils	5.1 mls

12. Wood (Except Walking Surfaces) - Semigloss

1st Coat (For Redwood and Cedar):		
	2110 Ultra-Hide Durus	Dry 1.5 mls
	Alkyd Pigmented Primer	VOC: 313 g/l
1st Coat (For all other woods):		
	2000 Decra-Shield	Dry 1.5 mls
	Exterior Latex Primer	VOC: 95 g/l
2nd Coat:	2406 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 229 g/l
3rd Coat:	2406 Decra-Shield	Dry 1.8 mls
	100% acrylic paint	VOC: 229 g/l
	Total Dry Mils	5.1 mls

B. Interior Finishes

1. Gypsum Wallboard - Flat

1st Coat:	LM 9116 Lifemaster	Dry 1.3 mils
	Interior Primer	VOC: 0 g/l
2nd Coat:	LM 9100 Lifemaster	Dry 1.3 mils
	Vinyl Acrylic	VOC: 0 g/l
3rd Coat:	LM 9100 Lifemaster	Dry 1.3 mils
	Vinyl Acrylic	VOC: 0 g/l
	Total Dry Mils	3.9

2. Gypsum Wallboard - Low Sheen

1st Coat:	LM 9116 Lifemaster	Dry 1.3 mils
	Interior Primer	VOC: 0 g/l
2nd Coat:	LM 9300 Lifemaster	Dry 1.6
	Vinyl Acrylic	VOC: 0 g/l
3rd Coat:	LM 9300 Lifemaster	Dry 1.6
	Vinyl Acrylic	VOC: 0 g/l
	Total Dry Mils	4.5

3. Gypsum Wallboard - Semigloss

1st Coat:	LM 9116 Lifemaster	Dry 1.3 mils
	Interior Primer	VOC: 0 g/l
2nd Coat:	LM 9200 Lifemaster	Dry 1.4 mils
	Vinyl Acrylic	VOC: 0 g/l
3rd Coat:	LM 9200 Lifemaster	Dry 1.4 mils
	Vinyl Acrylic	VOC: 0 g/l
	Total Dry Mils	4.1

4. Gypsum Wallboard - Semigloss (Toilet Room Wainscott)

1st Coat:	3210 Ultra Hide	Dry 1.5 mls

	Aquacrylic Gripper	VOC: 95 g/l
2nd Coat:	ICI 4406 TRUE-GLAZE WB	
	2-part waterbourne epoxy	Dry 2.0-5.0 mils - VOC: 200 g/l
3rd Coat:	ICI 4406 TRUE-GLAZE WB	-
	2-part waterbourne epoxy	Dry 2.0-5.0 mils - VOC: 200 g/l
	Total Dry Mils	5.5 mls min.

5. Cement Plaster, Concrete, Brick - Flat

1st Coat:	3210 Ultra-Hide	Dry 1.5 mls
	Aquacrylic Gripper	VOC: 95 g/l
2nd Coat:	LM 9100 Lifemaster	Dry 1.3 mils
	Vinyl Acrylic	VOC: 0 g/l
3rd Coat:	LM 9100 Lifemaster	Dry 1.3 mils
	Vinyl Acrylic	VOC: 0 g/l
	Total Dry Mils	4.1 mls

6. Cement Plaster, Concrete, Brick - Low Sheen

1st Coat:	3210 Ultra-Hide	Dry 1.5 mls
	Aquacrylic Gripper	VOC: 95 g/l
2nd Coat:	LM 9300 Lifemaster	Dry 1.6 mils
	Vinyl Acrylic	VOC: 0 g/l
3rd Coat:	LM 9300 Lifemaster	Dry 1.6 mils
	Vinyl Acrylic	VOC: 0 g/l
	Total Dry Mils	4.7 mls

7. Cement Plaster, Concrete, Brick - Semigloss

1st Coat:	3210 Ultra-Hide	Dry 1.5 mls
	Aquacrylic Gripper	VOC: 95 g/l
2nd Coat:	LM 9200 Lifemaster	Dry 1.4 mils
	Vinyl Acrylic	VOC: 0 g/l
3rd Coat:	LM 9200 Lifemaster	Dry 1.4 mils
	Vinyl Acrylic	VOC: 0 g/l
	Total Dry Mils	4.3 mls

8. Concrete Masonry Units - Flat

1st Coat:	4000 Bloxfil	Dry 7.0-14.5 mils
	Acrylic Block Filler	VOC: 67 g/l
2nd Coat:	LM 9100 Lifemaster	Dry 1.3 mils
	Vinyl Acrylic	VOC: 0 g/l
3rd Coat:	LM 9100 Lifemaster	Dry 1.3 mils
	Vinyl Acrylic	VOC: 0 g/l
	Total Dry Mils	9.6-17.1

9. Concrete Masonry Units - Low Sheen

1st Coat:	4000 Bloxfil	Dry 7.0-14.5 mils
	Acrylic Block Filler	VOC: 67 g/l
2nd Coat:	LM 9300 Lifemaster	Dry 1.6 mils
	Vinyl Acrylic	VOC: 0 g/l
3rd Coat:	LM 9300 Lifemaster	Dry 1.6 mils
	Vinyl Acrylic	VOC: 0 g/l
	Total Dry Mils	10.2-17.7

10. Concrete Masonry Units - Semigloss

1st Coat:	4000 Bloxfil	Dry 7.0-14.5 mils

	Acrylic Block Filler	VOC: 67 g/l
2nd Coat:	LM 9200 Lifemaster	Dry 1.4 mils
	Vinyl Acrylic	VOC: 0 g/l
3rd Coat:	LM 9200 Lifemaster	Dry 1.4 mils
	Vinyl Acrylic	VOC: 0 g/l
	Total Dry Mils	9.8-17.3

11. Acoustical Plaster, Acoustic Tile - Flat

1st Coat:	1250 Speed-Wall	Dry 1.5 mls
	Latex	VOC: 18 g/l

12. Wood, Hardboard - Low Sheen

1st Coat:	1020 Ultra-Hide	Dry 1.5 mls
	Acrylic Primer	VOC: 108 g/l
2nd Coat:	LM 9300 Lifemaster	Dry 1.6 mils
	Acrylic	VOC: 0 g/l
3rd Coat:	LM 9300 Lifemaster	Dry 1.6 mils
	Acrylic	VOC: 0 g/l
	Total Dry Mils	4.7 mils

13. Wood, Hardboard - Semigloss

1st Coat:	1020 Ultra-Hide	Dry 1.5 mils
	Acrylic Primer	VOC: 108 g/l
2nd Coat:	LM 9200 Lifemaster	Dry 1.4 mils
	Acrylic	VOC: 0 g/l
3rd Coat:	LM 9200 Lifemaster	Dry 1.4 mils
	Acrylic	VOC: 0 g/l
	Total Dry Mils	4.3 mils

14. Wood - Clear Low Luster

1st Coat:	1802 Woodpride	Dry .5-1.0 mils
	Interior Aquacrylic	VOC: 186 g/l - (reduced 20 %)
2nd Coat:	1802 Woodpride	Dry 1.4 mils
	Interior Aquacrylic	VOC: 186 g/l
3rd Coat:	1802 Woodpride	Dry 1.4 mils
	Interior Aquacrylic	VOC: 186 g/l
	Total Dry Mils	3.4 mils

15. Metal - Ferrous, Aluminum - Semigloss

1st Coat:	4120 Devguard	Dry 1.5-2.0 mils
	Metal Primer	VOC: 388 g/l
2nd Coat:	LM 9200 Lifemaster	Dry 1.4 mils
	Acrylic	VOC: 0 g/l
3rd Coat:	LM 9200 Lifemaster	Dry 1.4 mils
	Acrylic	VOC: 0 g/l
	Total Dry Mils	4.3-4.8 mls

16. Metal - Galvanized- Semigloss

Pretreatment:	vinegar wash per manufactuer	
1st Coat:	4120 Devguard	Dry 1.5-2.0 mils
	Metal Primer	VOC: 388 g/l
2nd Coat:	LM 2000 Lifemaster	Dry 1.4 mils
	Acrylic	VOC: 0 g/l
3rd Coat:	LM 2000 Lifemaster	Dry 1.4 mils

Acrylic	VOC: 0 g/l	
Total Dry Mils		4.3-4.8 mls

3.11 WASTE MANAGEMENT

A. Separate waste in accordance with the Waste Management Plan. Set aside extra paint for future color matches or reuse by Owner. Collect all waste paint by type and provide for delivery to recycling or collection facility.

B. Close and seal tightly all partly used paint and finish containers and store protected in well ventilated fire-safe area at moderate temperature.

C. Fully dry paint residues from latex paint may be disposed of in landfill.

D. Place empty containers of solvent based paints in areas designated for hazardous materials.

E. Do not dispose of paints or solvents by pouring on the ground. Place in designated containers for proper disposal.

F. Separate pallettes, packaging and all other materials in accordance with the Waste Management Plan and place in designated areas for recycling or reuse.

END OF SECTION

SECTION 09950 - WALLCOVERINGSError! Bookmark not defined.

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Provide all labor, materials and equipment to furnish and install vinyl wallcovering as required on the Delivery Order using methods, materials and equipment specified herein.

B. Types of wallcovering required include the following:

1. Vinyl-coated fabric wallcovering.

1.02 QUALITY ASSURANCE:

A. Manufacturer: Provide each type of wallcovering as produced by a single manufacturer, including recommended primers, adhesives, and sealants.

B. Installer: A specialist in wallcovering work with not less than three years of experience in installing wallcoverings similar to those required for this project.

1.03 SUBMITTALS:

A. Product Data: Submit manufacturer's technical data and installation instructions for each type of wallcovering and installation materials.

B. Samples: Submit full width samples of each type of wallcovering, illustrating range of color and pattern variation; submit sets of sample moldings.

C. Certification: Submit manufacturer's certification that materials furnished comply with requirements specified.

D. Maintenance Instructions: Submit manufacturer's printed instructions for maintenance of installed work, including precautions for use of cleaning materials which could damage wallcovering.

E. Replacement Materials: After completion of work, deliver to project site not less than 6 linear yards of each type, color, and pattern of wallcovering installed. Furnish replacement materials from same production run as materials installed.

1.04 DELIVERY AND STORAGE:

A. General: Comply with instructions and recommendations of manufacturer and as herein specified.

B. Deliver materials to project site in original packages or containers clearly labeled to identify manufacturer, brand name, quality or grade, and fire hazard classification.

C. Store materials in original undamaged packages or containers. Do not store rolled goods in upright position. Maintain temperature in storage area above 40 deg.F (40 deg.C).

1.05 JOB CONDITIONS:

A. Maintain constant minimum temperature of 60 deg.F (16 deg.C) at areas of installation for at least 72 hours before and 48 hours after application of materials.

PART 2 - PRODUCTS

2.01 VINYL WALLCOVERING:

A. General: Comply with FS CCC-W-408 for types required, and comply with requirements specified herein. Provide vinyl wallcovering material with suitable backing which has been treated with mildew and germicidal additives.

B. Medium Duty: Type II; total weight not less than 13 oz. per sq. yd.; vinyl coating not less than 7 oz. per sq. yd.

C. Stain-Resistant: Type II, with delustered clear poly vinyl fluoride film not less than 0.0005" (1/2 mil) thick as top coating complying with FS L-P-1040, Type I, Grade B, Class 2. Do not include weight of stain resistance coating as part of required vinyl coating weight or total fabric weight.

1. Color/Pattern/Texture: Match the Contracting Officer's sample.

2.02 ACCESSORY ITEMS:

A. Adhesives: Provide manufacturer's recommended adhesive, primer, and sealer, produced expressly for use with selected wallcovering on substrate as shown on drawings. Provide materials which are mildew-resistant and nonstaining to wallcovering.

B. Release Coat: Oil base sealer or enamel undercoating for virgin drywall substrate as recommended by wallcovering manufacturer.

C. Metal Molding: Provide molding manufactured expressly for use with wallcoverings, of 6063 aluminum alloy, with fine satin mechanical finish and clear anodic coating complying with AA-M21A3l; provide one-piece cap strip type with all flange tapering to feather edge.

1. Adhesive for Molding: Provide contact adhesive recommended by molding manufacturer.

D. Lining Paper: Provide paper lining material expressly designed for protection of wallcovering and recommended by manufacturer for application indicated.

PART 3 - EXECUTION

3.01 GENERAL

A. Acclimatize wallcovering materials by removing from packaging in area of installation not less than 24 hours before application.

B. Remove switch-plates, wall plates, and surface-mounted fixtures in areas where wallcovering is to be applied.

C. Prime and seal substrate in accordance with wallcovering manufacturer's recommendations for type of substrate. Apply surface sealer to gypsum drywall which will permit subsequent removal of all covering without damage to paper facing.

D. Test substrate with electronic moisture meter to verify that surfaces to be covered do not exceed 4% moisture content.

3.02 INSTALLATION:

A. Metal Moldings:

1. Furnish metal moldings for wainscot cap and perimeter edging where shown on drawings.

2. Install metal moldings in longest practicable lengths, by nailing and cementing to substrate in accordance with molding manufacturer's instructions. Tightly butt end joints and miter corner joints.

B. Vinyl Wallcovering:

1. Place wallcovering panels consecutively in order cut from rolls, including filling of spaces above or below openings. Hang by reversing alternate strips except on match patterns.

2. Apply adhesive to back of wall covering and place in accordance with manufacturer's instructions. Install seams plumb, and at least 6" away from corners. Horizontal seams are not permitted. Overlap seams and double-cut to assure tight closure. Roll, brush, or use broad knife to remove air bubbles, wrinkles, blisters, and other defects. Cut wall covering evenly to edges of wall penetrations.

3. Trim, selvages as required to assure color uniformity and pattern match.

4. Remove excess adhesive along finished seams while it is still wet using warm water and clean sponge, and wipe dry.

3.03 ADJUST AND CLEAN:

A. Replace removed plates and fixtures; verify cut edges of wall coverings are completely concealed.

B. Remove surplus materials, rubbish, and debris resulting from wall covering installation upon completion of work, and leave areas of installation in neat, clean condition.

END OF SECTION 09950

SECTION 10618 - DEMOUNTABLE METAL PANEL PARTITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes mostly reusable partition assemblies composed of ceiling and floor channels, vertical support framing, and steel-faced panels forming a cavity wall.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Lock and latch sets are specified in Division 8 Section "Door Hardware."
2. Suspended ceilings are specified in a Division 9 Section.
3. Electrical connections are specified in a Division 16 Section.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. Acoustical Performance: Provide demountable metal panel systems tested by a qualified independent testing agency for the following acoustic properties according to following test method:

1. Sound Transmission Requirements: Demountable metal panel partition tested for laboratory sound transmission loss performance according to ASTM E 90, determined by ASTM E 413 and rated for an STC plus or minus 1 as follows:

a. Sound Transmission Class (STC): 43.

B. Load and Endurance Performance: Provide demountable metal panel systems tested by a qualified independent testing agency for load and endurance properties, complying with ANSI/BIFMA X5.6.

1.4 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data for each type of product specified. Include installation methods for each type of ceiling and floor condition.

C. Shop drawings showing layout and types of wall panels and door frame panels and relationships to adjacent construction.

D. Samples for initial selection purposes in the form of manufacturer's color charts showing a full range of colors, textures, and patterns available for each type panel finish face indicated.

E. Samples for verification purposes of each type of finish indicated, in sets for each color, texture, and pattern specified, showing a full range of variations expected in these characteristics.

1. Panel Finish Face: Manufacturer's standard size unit, not less than 3 inches square.
2. Door Finish Face: Manufacturer's standard size unit, not less than 3 inches square.
3. Panel Glazing: Manufacturer's standard size unit, not less than 3 inches square.
4. Base Trim: 12 inch long sample.
5. Between Panel Trim: 12 inch long sample.

F. Maintenance data for panels to include in the "Operating and Maintenance Manual" specified in Division 1.

1. Methods for maintaining panels.
2. Precautions for cleaning materials and methods that could be detrimental to finishes and performance.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who is certified in writing by the demountable metal panel system manufacturer as qualified to install manufacturer's system.

B. Surface-Burning Characteristics: Provide a demountable metal panel system with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or other testing and inspecting agencies acceptable to authorities having jurisdiction.

1. Flame Spread: 25 or less.
2. Smoke Developed: 450 or less.

C. Single-Source Responsibilities: Obtain demountable metal panel system from one source from a single manufacturer.

D. Coordination of Work: Coordinate layout and installation of demountable metal panel components with other units of work including ceilings, light fixtures, HVAC equipment, and fire-suppression systems.

1.6 PROJECT CONDITIONS

A. Field Measurements: Check demountable metal panel system layout by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid a delay in the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

B. Products: Subject to compliance with requirements, provide one of the products specified in each Demountable Metal Panel Partition Product Data Sheet.

2.2 DEMOUNTABLE METAL PANEL PARTITIONS

A. Panels: One-piece, full-height, gypsum wall board with laminated steel face sheet.
1. Panel Width: 24 inches (610 mm).
2. Panel Width: 30 inches (762 mm).

3. Panel Width: 48 inches (1220 mm).
4. Panel Finish Face: Factory finished.

B. Concealed Runners and Framing: Manufacturer's standard vertical and horizontal members, galvanized or prime-painted steel.

C. Base: Manufacturer's standard, snap-on metal.

D. Doors: Steel of types and styles or grades and models indicated on Drawings or schedules.

E. Doors: Solid-core wood of types and styles or grades and models indicated on Drawings or schedules.

F. Door Frames: Factory-mortised to receive finish hardware and 1-3/4 inch (44 mm) doors.

1. Steel with vinyl finish.
2. Steel with paint finish.
3. Reversible aluminum with snap-in head for ceiling height openings.
4. Reversible aluminum with milled head and snap-in trim for door-height openings.
   a. Aluminum finish, clear anodized; NAAMM AA-C22A31, Class II.

5. One and one-half pair 4-1/2 by 4-1/2 inch (113 by 113 mm) hinges and standard strike for each frame.

G. Light and Sounds Seals: Manufacturer's standard.

H. Glazing: With factory-applied identifying label on each pane. Provide glass in thickness recommended by glass manufacturer to suit size of glazed openings.

1. Flat Glazing: ASTM C 1036.
2. Heat-Treated Flat Glazing: ASTM C 1048.
3. Laminated Glazing: ASTM C 1172.
   a. Clear Float: Type I (transparent), Class 1 (clear), Quality q3 (glazing select).
   b. Patterned: Type II (patterned and wired glass, flat), Class 1 (clear), Quality q8 (glazing), Finish f1 (patterned one side).

I. Insulation: Inorganic, mineral filler for sound deadening.

J. Transom Panels: Material and finish to match wall panels, unless otherwise indicated.

K. Colors and Finishes: Selected by Contracting Officer from manufacturer's standard color and finish selection.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions where panel system is to be installed.

B. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install demountable partition system rigid, level, plumb, and aligned. Provide continuous seal to prevent light and sound transmission at floor, ceiling, fixed walls, and adjacent surfaces.

3.3 ADJUSTING

A. Adjust door hardware for proper operating condition.

3.4 DEMONSTRATION

A. Startup Services: Provide the services of a factory-authorized service representative to demonstrate and train Owner's representative.

1. Adjust panels and trim. Replace damaged or malfunctioning components.
2. Train Owner's representative on procedures and schedules related to installing, relocating, servicing, and refinishing panels and components.
3. Review data in the "Operating and Maintenance Manual."

END OF SECTION 10618

SECTION 12500 - WINDOW TREATMENT

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. The extent of window treatment is indicated on the Delivery Order. Types of window treatment work in this section include:

1. Horizontal blinds.

1.02 QUALITY ASSURANCE:

A. Provide window treatment units which are complete assemblies produced by one manufacturer for each type required, including hardware, accessory items, mounting brackets, and fastenings.

B. Provide materials in colors and patterns (if any) as indicated, or, if not indicated, as selected by the Contracting Officer from manufacturer's standard colors/patterns.

1.03 SUBMITTALS:

A. Product Data: Submit manufacturer's specifications and installation instructions for each type of window treatment unit required. Include methods of installation for each type of opening and supporting structure.

1. For initial selection of colors, submit manufacturer's color charts consisting of sections of exposed components with integral or applied finishes showing full range of colors, materials, etc. available for each type of window treatment assembly required.

2. For verification purposes, submit samples of each component, material and finish which will be exposed to view, for each type of window treatment required. Prepare samples from same materials to be used for the work.

a. In addition, submit one complete Small-size operating unit for each type of window treatment required.

B. Maintenance Stock: Deliver stock of maintenance material to Government. Furnish maintenance material matching products installed, packaged with protective covering for storage and identified with appropriate labels.

1. Typical Window Treatment Units: Furnish quantity of typical window treatment units equal to 5% of amount installed.

PART 2 - PRODUCTS

2.01 HORIZONTAL BLINDS:

A. Headrail: Manufacturer's standard headrail consisting of channel-shaped section fabricated from minimum, 0.025" thick sheet steel with rolled edges at top. Increase metal thickness

as recommended by manufacturer for large blind units. Furnish complete with tilting mechanism, top and end braces, top cradles, cord lock, and accessory items required for type of blind and installation indicated.

B. Bottom Rail: Manufacturer's standard tubular steel bottom rail, designed to withstand twisting or sagging. Contour top surface to match slat curvature, with flat or slightly curved bottom. Close ends with manufacturer's standard metal or plastic end caps, of same color as rail. Finish rail in same color as slats, unless otherwise indicated.

C. Slats: Manufacturer's standard, spring-tempered aluminum slats, 0.010" thick, (louver blades), with rounded corners and forming burrs removed, as follows:

1. Slat Width: Match existing.

a. Provide slats designed and spaced to achieve maximum overlap and closure for optimum light exclusion. Notch rear of blade at ladders and offset rout holes at lift cords to enable blades to touch one another when closed.

D. Ladders: Manufacturer's standard ladder construction designed to support and maintain slats at proper spacing and alignment in open and closed positions, as follows:

1. Braided polyester cord design consisting of vertical elements of not less than 0.045" nor more than 0.066" in diameter and integrally braided ladder rungs of not less than 4 threads; space ladders not further than 24" apart and 7" from ends of slats.

2. Tape and ladder assembly consisting of 1-1/2" wide longitudinal reinforced vinyl plastic tape with one piece vinyl plastic ladder construction, complying with FS AA-V00200B; space ladders not further than 36" apart.

E. Tilting Mechanism: Manufacturer's standard assembly including low friction gear tilter, drum and cradle at each ladder, tilt rod, tape clips, and grommet guides to prevent wear on ladder and cords; designed to hold slats at any angle and prevent movement of slats due to vibration, operated as follows:

1. Cord Operation: manufacturer's standard cord matching lift cord in material, size and appearance, fitted with tassels and proper length for blind installation.

F. Lifting Mechanism: Manufacturer's standard including crash-proof cord locks with cord separators and braided polyester or nylon lift cords with tassels at ends. Size cord to suit blind type. Include cord equalizers of self-aligning type designed to maintain horizontal blind position.

G. Installation Brackets: Manufacturer's standard brackets designed to facilitate removal of head channels. Provide intermediate brackets at spacing recommended by blind manufacturer. Include hardware necessary for secure attachment of brackets to adjoining construction and to head rails. Design brackets to support safely the weight of blind assemblies plus forces applied to operate blinds.

H. Side Channels: Provide side channels identical in appearance to headrail and designed to reduce light leakage at edges of blinds.

I. Finish: Provide finishes as selected by the Contracting Officer and as listed below.

1. Aluminum Slats: Provide manufacturer's standard factory-applied finish system consisting of chemical conversion coating followed by baked-on synthetic resin enamel finish coat.

2.02 FABRICATION AND OPERATION:

A. Prior to fabrication, verify actual opening dimensions by accurate site measurements. Adjust-dimensions for proper fit at openings. Cooperate with other trades for securing tracks to substrate and other finished surfaces.

B. Fabricate window treatment components from noncorrosive, non-staining, non-fading materials which are completely compatible with each other, and which do not require lubrication during normal expected life.

C. Fabricate blind units to completely fill the openings as shown, from head-to-sill and jamb-to-jamb.

D. Space supporting ladders to comply with manufacturer's standards, unless otherwise indicated.

E. Space slats to provide overlap for light exclusion when in fully closed position.

F. Equip horizontal blind units, unless otherwise indicated for the following operation:

1. Full-tilting operation with slats rotating approximately 180 deg. Place tilt operating controls on left-hand side of blind units, unless otherwise indicated.

2. Full-height raising, to manufacturer's minimum stacking dimension, with lifting cord locks for stopping blind at any point of ascending or descending travel. Place pull cords on right-hand side of blind units, unless otherwise indicated.

PART 3 – EXECUTION

3.01 INSTALLATION:

A. Install window treatment units in manner indicated to comply with manufacturer's instructions. Position units level, plumb, secure, at proper height and location relative to adjoining window units and other related work. Securely anchor units with proper clips, brackets, anchorage’s, suited to type of mounting indicated.

B. Provide adequate clearance between sash and blinds to permit unencumbered operation of sash hardware.

C. Divisions between blinds are permitted only at mullions by continuous windows or openings where more than one blind for one opening occurs, unless otherwise indicated.

D. Isolate metal parts from concrete and mortar to prevent galvanic action. Use tape or thick coating or other means recommended by manufacturer to effect separation.

E. Protect installed units to ensure their being in operating condition, without damage, blemishes, or indication of use at completion of project. Repair or replace damaged units as directed by the Contracting Officer.

END OF SECTION 12500

SECTION 15325 - STANDPIPE AND SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies standpipe and sprinkler systems for buildings and structures.

B. Products specified in this Section with installation not in Contract include sprinkler cabinets with spare sprinklers and sprinkler wrenches. Deliver to the Owner's maintenance personnel.

C. Products installed but not specified in this Section include water meters that will be furnished by the utility company to the site and ready for installation. This is the name and address of the utility company:

D. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 2 Section "Water Systems" for water supply piping from water source to inside of building.
2. Division 7 Section "Firestopping" for fire barrier sealers.
3. Division 10 Section "Fire Extinguishers, Cabinets, and Accessories" for fire extinguishers and cabinets for fire extinguishers, hose valves, and rack and hose assemblies.
4. Division 15 Section "Fire Pumps."
5. Division 15 Section "Plumbing Piping" for water supply when Work of this Section connects to water distribution system inside building.
6. Division 15 Section "Water Distribution Piping" for water supply when Work of this Section connects to water distribution system inside building.
7. Division 15 Section "Compressed-Air Systems" for compressed air supply piping for specialty valves.
8. Division 16 Section "Fire Alarm Systems" for alarm devices not specified in this Section.

1.3 DEFINITIONS

A. Working plans as used in this Section refer to documents (including drawings and calculations) prepared pursuant to requirements in NFPA 13 for obtaining approval of authority having jurisdiction.

B. Other definitions for fire protection systems are included in referenced NFPA standards.

1.4 SYSTEM DESCRIPTION

A. Wet-Pipe Sprinkler System: System with automatic sprinklers attached to piping system containing water and connected to water supply so that water discharges immediately from sprinklers when they are opened by fire.

B. Dry-Pipe Sprinkler System: System with automatic sprinklers attached to piping system containing air or nitrogen under pressure. Release of pressure (opening of sprinklers) permits

water pressure to open dry-pipe valve. Water then flows into piping and discharges through open sprinklers.

1. Pressurizing Gas: Compressed air, from sprinkler system air compressors.
2. Pressurizing Gas: Compressed air, from building compressed air system.
3. Pressurizing Gas: Compressed air, from cylinders.
4. Pressurizing Gas: Nitrogen, from cylinders.

C. Preaction Sprinkler System: System with automatic sprinklers attached to piping system containing air that may be under pressure. Include supplemental fire detection system in same areas as sprinklers. Actuation of fire detection system opens deluge valve permitting water flow into sprinkler piping system and discharge from sprinklers that have opened.

D. Combination Dry-Pipe and Preaction Sprinkler System: System with automatic sprinklers attached to piping system containing air or nitrogen under pressure. Include supplemental fire detection system in same areas as sprinklers. Operation of fire detection system actuates tripping devices that open dry-pipe valves simultaneously and without loss of air pressure in system. Operation of fire detection system also opens approved air exhaust valves at end of feed mains. This helps fill system with water and usually precedes opening of sprinklers. Fire detection system will also activate fire alarm system. Water discharges from sprinklers when they are opened by fire.

1. Pressurizing Gas: Compressed air, from sprinkler system air compressors.
2. Pressurizing Gas: Compressed air, from building compressed air system.
3. Pressurizing Gas: Compressed air, from cylinders.
4. Pressurizing Gas: Nitrogen, from cylinders.

E. Deluge Sprinkler System: System with open sprinklers attached to piping system connected to water supply through deluge valve. Valve is opened by operation of fire detection system in same areas as sprinklers. When valve opens, water flows into piping system and discharges from attached sprinklers.

F. Sprinkler System Protection Limits: All spaces within areas indicated. Include closets, toilet and locker room areas, each landing of each stair, and special applications areas.

1. Exception: Areas with other fire extinguishing systems and areas indicated to be without sprinkler protection.
2. Exception: Light-hazard occupancy, dwelling unit bathrooms 55 sq. ft. (5.1 sq. m) and less and closets 24 sq. ft. (2.2 sq. m) and less that also comply with other NFPA 13 requirements.

G. Standpipe Systems: Systems that are wet type have water supply valve open and pressure maintained at all times and include branches extending from standpipes to sprinkler zone valves.

H. Class I, Standpipe and Hose System: Arrangement of piping, valves, hose connections, hose, and accessories for use by persons trained in use of heavy fire streams. Valves are 2-1/2-inch (DN 65) size.

I. Class II, Standpipe and Hose System: Arrangement of piping, valves, hose connections, hose, and accessories for use by building occupants during initial response. Valves are 1-1/2-inch (DN 40) size.

J. Class III, Standpipe and Hose System: Arrangement of piping, valves, hose connections, hose, and accessories for use by building occupants and persons trained in use of heavy fire streams. Valves are both 2-1/2-inch (DN 65) and 1-1/2-inch (DN 40) sizes.

1.5 SYSTEM PERFORMANCE REQUIREMENTS

A. Design and obtain approval from authority having jurisdiction for fire protection systems specified.

B. Minimum Pipe Sizes: Not smaller than sizes indicated for connection to water supply piping, standpipes, and branches from standpipes to sprinklers.

C. Conduct fire hydrant flow tests as required to obtain hydraulic data needed to prepare design for hydraulically calculated systems.

D. Hydraulically design sprinkler systems according to:

1. Sprinkler System Occupancy Hazard Classifications: As follows:

a. Office and Public Areas: Light hazard.
b. Storage Areas: Ordinary hazard.
c. Equipment Rooms: Ordinary hazard.
d. Service Areas: Ordinary hazard.

2. Minimum Density Requirements for Automatic Sprinkler System Hydraulic Design: As follows:

a. Light Hazard Occupancy: 0.10 GPM over 1500 sq. ft. (6.3 mL/s over 140 sq. m) area.
b. Ordinary Hazard, Group 1 Occupancy: 0.15 GPM over 1500 sq. ft. (9.5 mL/s over 140 sq. m) area.
c. Ordinary Hazard, Group 2 Occupancy: 0.20 GPM over 1500 sq. ft. (12.6 mL/s over 140 sq. m) area.
d. Extra Hazard, Group 1 Occupancy: 0.30 GPM over 2500 sq. ft. (18.9 mL/s over 233 sq. m) area.
e. Extra Hazard, Group 2 Occupancy: 0.40 GPM over 2500 sq. ft. (25.2 mL/s over 233 sq. m) area.
f. Special Occupancy Hazard: As determined by authority having jurisdiction.

3. Minimum Density Requirements for Deluge Sprinkler System Hydraulic Design: As follows:

a. Ordinary Hazard, Group 1 Occupancy: 0.15 GPM (9.5 mL/s) over entire system area.
b. Ordinary Hazard, Group 2 Occupancy: 0.20 GPM (12.6 mL/s) over entire system area.
c. Extra Hazard, Group 1 Occupancy: 0.30 GPM (18.9 mL/s) over entire system area.
d. Extra Hazard, Group 2 Occupancy: 0.40 GPM (25.2 mL/s) over entire system area.
e. Special Occupancy Hazard: As determined by authority having jurisdiction.

4. Maximum Sprinkler Spacing: As follows:

a. Office Space: 120 sq. ft./sprinkler (11 sq. m/sprinkler).
b. Storage Areas: 130 sq. ft./sprinkler (12 sq. m/sprinkler).
c. Mechanical Equipment Rooms: 130 sq. ft./sprinkler (12 sq. m/sprinkler).

d. Electrical Equipment Rooms: 130 sq. ft./sprinkler (12 sq. m/sprinkler).
e. Other Areas: According to NFPA 13.

E. Components and Installation: Capable of producing piping systems with the following minimum working pressure ratings except where indicated otherwise.

1. Sprinkler Systems: 175 psig (1200 kPa).
2. Standpipe and Hose Systems: 175 psig (1200 kPa).

1.6 SUBMITTALS

A. Product data for fire protection system components. Include the following:

1. Water meters.
2. Backflow preventers.
3. Valves.
4. Specialty valves, accessories, and devices.
5. Alarm devices. Include electrical data.
6. Air compressors.
7. Fire department connections. Include type of fire department connection; number, size, type, and arrangement of inlets; size and direction of outlet; and finish.
8. Hose valves. Include size, type, and finish.
9. Hose valves and racks, hoses, and nozzles. Include size, type, and finish of hose valves; type and length of hoses; finish of hose couplings; type, material, and finish of nozzles; and finish of rack.
10. Excess pressure pumps. Include electrical data.
11. Sprinklers, escutcheons, and guards. Include sprinkler flow characteristics, mounting, finish, and other data.

B. Sprinkler system drawings identified as "working plans," prepared according to NFPA 13. Submit required number of sets to authority having jurisdiction for review, comment, and approval. Include system hydraulic calculations where applicable.

C. Licensed engineer's sprinkler system drawings specified in "Quality Assurance" Article to authority having jurisdiction. Include system hydraulic calculations where applicable.

D. Sprinkler system drawings, identified as "working plans" and prepared according to NFPA 13, that have been approved by authority having jurisdiction. Include system hydraulic calculations where applicable.

E. Licensed engineer's installation report specified in "Field Quality Control" Article.

F. Test reports and certificates as described in NFPA 13. Include "Contractor's Material & Test Certificate for Aboveground Piping" and "Contractor's Material & Test Certificate for Underground Piping."

G. Maintenance data for each type of fire protection specialty specified, for inclusion in "Operating and Maintenance Manual" specified in Division 1 Section "Project Closeout."

H. 2 copies of NFPA 13A "Recommended Practice for the Inspection, Testing and Maintenance of Sprinkler Systems." Deliver to Owner's maintenance personnel.

I. 2 copies of NFPA 14A "Recommended Practice for the Inspection, Testing and Maintenance of Standpipe and Hose Systems." Deliver to Owner's maintenance personnel.

J. 2 copies of NFPA 25 "Standard for Inspection, Testing and Maintenance of Water Based Fire Protection Systems." Deliver to Owner's maintenance personnel.

K. 2 copies of NFPA 1962 "Standard for the Care, Use, and Service Testing of Fire Hose Including Couplings and Nozzles." Deliver to Owner's maintenance personnel.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firms whose equipment, specialties, and accessories are listed by product name and manufacturer in UL Fire Protection Equipment Directory and FM Approval Guide and that conform to other requirements indicated.

B. Listing/Approval Stamp, Label, or Other Marking: On equipment, specialties, and accessories made to specified standards.

C. Listing and Labeling: Equipment, specialties, and accessories that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in "National Electrical Code," Article 100.

2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

D. Comply with requirements of authority having jurisdiction for submittals, approvals, materials, hose threads, installation, inspections, and testing.

E. Licensed Engineer: Submit design drawings, design calculations, and installation inspection reports. Include seal and signature of registered engineer licensed in jurisdiction where Project is located, certifying compliance with specifications.

F. Installer's Qualifications: Firms qualified to install and alter fire protection piping, equipment, specialties, and accessories, and repair and service equipment. A qualified firm is one that is experienced (minimum of 5 previous projects similar in size and scope to this Project) in such work, familiar with precautions required, and in compliance with the requirements of the authority having jurisdiction. Submit evidence of qualifications to the Architect upon request. Refer to Division 1 Section "Reference Standards and Definitions" for definition of "Installer."

G. NFPA Standards: Equipment, specialties, accessories, installation, and testing complying with the following:

1. NFPA 13 "Standard for the Installation of Sprinkler Systems."
2. NFPA 13R "Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height."
3. NFPA 14 "Standard for the Installation of Standpipe and Hose Systems."
4. NFPA 26 "Recommended Practice for the Supervision of Valves Controlling Water Supplies for Fire Protection."
5. NFPA 70 "National Electrical Code."
6. NFPA 231 "Standard for General Storage."
7. NFPA 231C "Standard for Rack Storage of Materials."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Specialty Valves, Water Motor Alarms, and Air-Pressure Maintenance Devices:

    a. ASCOA Fire Systems, Figgie International Co.
    b. Central Sprinkler Corp.
    c. Firematic Sprinkler Devices, Inc.
    d. Gem Sprinkler Co. Div., Grinnell Corp.
    e. Globe Fire Sprinkler Corp.
    f. Reliable Automatic Sprinkler Co., Inc.
    g. Star Sprinkler Corp.
    h. Viking Corp.

2. Detector Check Valves:

    a. Ames Co., Inc.
    b. Cla-Val Co.
    c. Hersey Products, Inc., Grinnell Corp.
    d. Kennedy Valve Div., McWane, Inc.
    e. Viking Corp.
    f. Watts Regulator Co.

3. Water Meters:

    a. Badger Meter, Inc.
    b. Hersey Products, Inc., Grinnell Corp.
    c. Kent Meters, Inc.
    d. Neptune Water Div., Schlumberger Industries, Inc.
    e. Sensus Technologies, Inc., BTR Co.

4. Backflow Preventers:

    a. Ames Co., Inc.
    b. Cla-Val Co.
    c. Conbraco Industries, Inc.
    d. Febco.
    e. Hersey Products, Inc., Grinnell Corp.
    f. Watts Regulator Co.
    g. Wilkins Regulator Div., Zurn Industries, Inc.

5. Waterflow Indicators and Supervisory Switches:

    a. Gamewell Co.
    b. Gem Sprinkler Co. Div., Grinnell Corp.
    c. Potter Electric Signal Co.
    d. Reliable Automatic Sprinkler Co., Inc.
    e. System Sensor Div., Pittway Corp.
    f. Victaulic Company of America.
    g. Watts Regulator Co.

6. Fire Department Connections:

    a. Badger-Powhatan, Figgie International Co.
    b. Croker Div., Fire-End and Croker Corp.
    c. Elkhart Brass Mfg. Co., Inc.
    d. Firematic Sprinkler Devices, Inc.
    e. Gem Sprinkler Co. Div., Grinnell Corp.
    f. Guardian Fire Equipment, Inc.
    g. Potter-Roemer Div., Smith Industries, Inc.
    h. Reliable Automatic Sprinkler Co., Inc.
    i. Sierra Fire Equipment Co.

7. Excess Pressure Pumps:

    a. Gamewell Co.

8. Sprinklers:

    a. ASCOA Fire Systems, Figgie International Co.
    b. Central Sprinkler Corp.
    c. Firematic Sprinkler Devices, Inc.
    d. Gem Sprinkler Co. Div., Grinnell Corp.
    e. Globe Fire Sprinkler Corp.
    f. Reliable Automatic Sprinkler Co., Inc.
    g. Star Sprinkler Corp.
    h. Viking Corp.

9. Hose Valves and Racks and Hose:

    a. Badger-Powhatan, Figgie International Co.
    b. Croker Div., Fire-End and Croker Corp.
    c. Elkhart Brass Mfg. Co., Inc.
    d. Guardian Fire Equipment, Inc.
    e. Potter-Roemer Div., Smith Industries, Inc.
    f. Sierra Fire Equipment Co.

10. Indicator Posts and Indicator Post Gate Valves:

    a. Clow Valve Co. Div., McWane, Inc.
    b. Gem Sprinkler Co. Div., Grinnell Corp.
    c. Kennedy Valve Div., McWane, Inc.
    d. Nibco, Inc.
    e. Stockham Valves and Fittings, Inc.
    f. Waterous Co.

11. Indicator Valves:

    a. Gem Sprinkler Co. Div., Grinnell Corp.
    b. Grinnell Supply Sales Co., Grinnell Corp.
    c. Kennedy Valve Div., McWane, Inc.
    d. Milwaukee Valve Co., Inc.
    e. Nibco, Inc.
    f. Sprink-Line by Sprink, Inc.

g. Victaulic Company of America.

12. Fire Protection Service Gate and Check Valves:

a. Gem Sprinkler Co. Div., Grinnell Corp.
b. Kennedy Valve Div., McWane, Inc.
c. Nibco, Inc.
d. Stockham Valves and Fittings, Inc.
e. Victaulic Company of America.

13. Grooved Couplings for Steel Piping:

a. Grinnell Supply Sales Co., Grinnell Corp.
b. Gustin-Bacon Div., Tyler Pipe Subsid., Tyler Corp.
c. Sprink-Line by Sprink, Inc.
d. Stockham Valves and Fittings, Inc.
e. Victaulic Company of America.

14. Grooved Couplings for AWWA Ductile-Iron Piping:

a. Gustin-Bacon Div., Tyler Pipe Subsid., Tyler Corp.
b. Victaulic Company of America.

15. Grooved Couplings for Copper Tubing:

a. Victaulic Company of America.

16. Press-Seal Fittings for Steel Piping:

a. Victaulic Company of America.

17. Mechanically Formed Outlet Procedure:

a. T-Drill Industries, Inc.

2.2 PIPES AND TUBES

A. Refer to Part 3 Articles "Sprinkler System Piping Applications" and "Standpipe System Piping Applications" for identification of systems where pipe and fitting materials specified below are used.

B. Ductile-Iron Pipe: AWWA C115, ductile-iron barrel with iron-alloy threaded flanges, 250 psig (1725 kPa) minimum working pressure rating, and AWWA C104 cement-mortar lining.

1. Option: Pipe may be AWWA pattern, cut-grooved for grooved-coupling joints.

C. Steel Pipe: ASTM A 53, Schedule 40 in sizes 6 inches (DN 150) and smaller and Schedule 30 in sizes 8 inches (DN 200) and larger, black and galvanized, plain and threaded ends, for welded, threaded, cut-groove, and rolled-groove joints.

D. Steel Pipe: ASTM A 135, Schedule 10 through 5-inch (DN 125) sizes and NFPA 13 specified wall thickness for 6-inch (DN 150) through 10-inch (DN 250) sizes, with plain ends, black and galvanized, for rolled-groove and welded joints.

E. Steel Pipe: ASTM A 135, threadable lightwall, black and galvanized, for threaded joints.

F. Steel Pipe: ASTM A 135 or ASTM A 795, Schedule 5, plain ends and black finish, for use with press-seal or rolled-groove fittings.

G. Steel Pipe: ASTM A 795, black and galvanized, for joints listed and for use with fittings for plain-end steel pipe.

1. Type: Standard-weight pipe, Schedules 30 and 40, for cut-groove, rolled-groove, threaded, and welding joints.
2. Type: Lightweight pipe, Schedule 10, for rolled-groove and welding joints.
3. Type: Extra-lightweight pipe, thickness less than Schedule 10, for rolled-groove and welding joints.

H. Copper Tube: ASTM B 88, Types L and M (ASTM B 88M, Types B and C), water tube, drawn temper.

I. Chlorinated Polyvinyl Chloride (CPVC) Plastic Pipe: ASTM F 442, UL-listed, 175 psig (1200 kPa) rating, made in NPS for sprinkler service. Include "Listed" and "CPVC Sprinkler Pipe" marks on pipe.

J. Polybutylene (PB) Plastic Pipe: ASTM D 3309, UL-listed, 175 psig (1200 kPa) rating, made in copper tube sizes for sprinkler service. Include "Listed" and "PB Sprinkler Pipe" marks on pipe.

2.3 PIPE AND TUBE FITTINGS

A. Cast-Iron Threaded Flanges: ASME B16.1, Class 250, raised ground face, bolt holes spot faced.

B. Ductile-Iron and Gray-Iron Flanged Fittings: AWWA C110, 250-psig (1725-kPa) minimum pressure rating, with AWWA C104 cement-mortar lining.

C. Cast-Iron Threaded Fittings: ASME B16.4, Class 250, standard pattern, with threads according to ASME B1.20.1.

D. Malleable-Iron Threaded Fittings: ASME B16.3, Class 300, standard pattern, with threads according to ASME B1.20.1.

E. Grooved-End Fittings for Ductile-Iron Pipe: ASTM A 536 ductile-iron or ASTM A 47 malleable-iron, AWWA pipe-size, designed to accept AWWA C606 grooved couplings. Include cement lining or Food and Drug Administration (FDA)-approved interior coating.

F. Steel Fittings: ASTM A 234/A 234M, seamless or welded; ASME B16.9, buttwelding; or ASME B16.11, socket-welding type for welded joints.

G. Steel Flanges and Flanged Fittings: ASME B16.5.

H. Grooved-End Fittings for Steel Pipe: UL-listed and FM-approved, ASTM A 536, Grade 65-45-12 ductile iron or ASTM A 47 Grade 32510 malleable iron, with grooves or shoulders designed to accept grooved couplings.

I. Steel Press-Seal Fittings: UL 213, FM-approved, 175 psig (1200 kPa) pressure rating, for use with Schedule 5, plain-end, steel pipe and fitting manufacturer's pressure sealing tools. Fittings include carbon-steel housing, butylene O-rings, and pipe stop.

J. Wrought-Copper Fittings: ASME B16.22, streamlined pattern.

K. Cast-Bronze Flanges: ASME B16.24, Class 300, raised ground face, bolt holes spot faced.

L. Grooved-End Fittings for Copper Tube: UL-listed, ASTM B 75 (ASTM B 75M), copper tube and ASTM B 584 bronze castings, designed for grooved-end couplings.

M. Mechanically Formed Outlets for Copper Tube: Manufacturer's UL-listed, standard, written procedure for forming "T"-branch outlets.

N. Chlorinated Polyvinyl Chloride (CPVC) Plastic Pipe Fittings: ASTM F 438 for 3/4 inch (DN 20) to 1-1/2 inches (DN 40) and ASTM F 439 for 2 inches (DN 50) to 3 inches (DN 80), UL listed, 175 psig (1200 kPa) rating, made in NPS for sprinkler service. Include "Listed" and "CPVC Sprinkler Fitting" marks on fittings.

O. Polybutylene (PB) Plastic Pipe Fittings: ASTM D 3309, UL-listed, 175 psig (1200 kPa) rating, socket-fusion type, made in copper tube sizes for sprinkler pipe service. Include "Listed" and "PB Sprinkler Fitting" marks on fittings.

2.4 JOINING MATERIALS

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for joining materials not included in this Section.

B. Flanged Joints for Ductile-Iron Pipe and Ductile-Iron or Cast-Iron Fittings: AWWA C115 ductile-iron or gray-iron pipe flanges, rubber gaskets, and high-strength steel bolts and nuts.

C. Brazing Filler Metals: AWS A5.8, Classification BCuP-3 or BCuP-4.

D. Couplings for Grooved-End Steel Pipe and Grooved-End Ferrous Fittings: UL 213, AWWA C606, ASTM A 536 ductile-iron or ASTM A 47 malleable-iron housing, with enamel finish. Include synthetic-rubber gasket with central-cavity, pressure-responsive design; ASTM A 183 carbon-steel bolts and nuts; and locking pin, toggle, or lugs to secure grooved pipe and fittings.

1. Dry-Pipe-Systems Couplings: UL-listed for dry-pipe service.

E. Couplings for Grooved-End Ductile-Iron Pipe and Fittings: UL 213, AWWA C606, ASTM A 536 ductile-iron housing, with enamel finish. Include synthetic-rubber gasket with central-cavity, pressure-responsive design, and ASTM A 183 carbon-steel bolts and nuts to secure grooved pipe and fittings.

1. Dry-Pipe-Systems Couplings: UL-listed for dry-pipe service.

F. Couplings for Grooved-End Copper Tube and Grooved-End Copper Fittings: UL 213, ASTM A 536 ductile-iron or ASTM A 47 malleable-iron housing, with copper-colored enamel finish. Include synthetic-rubber gasket with central-cavity, pressure-responsive design, and ASTM A 183 carbon-steel bolts and nuts.

1. Dry-Pipe-Systems Couplings: UL-listed for dry-pipe service.

G. CPVC Cement: Primer and solvent cement made by pipe and fitting manufacturer for joining sprinkler piping.

2.5 GENERAL-DUTY VALVES

A. Refer to Division 15 Section "Valves" for general-duty gate, ball, butterfly, globe, and check valves.

2.6 FIRE PROTECTION SERVICE VALVES

A. General: UL-listed and FM-approved, with 175 psig (1200 kPa) non-shock minimum working pressure rating.

1. Option: Valves for use with grooved piping may be grooved type.

B. Gate Valves, 2 Inches (DN 50) and Smaller: UL 262, cast-bronze, threaded ends, solid wedge, outside screw and yoke, rising stem.

C. Indicating Valves, 2-1/2 Inches (DN 65) and Smaller: Butterfly or ball type, bronze body with threaded ends, and integral indicating device.

1. Indicator: Visual.
2. Indicator: Electrical 115 volts a.c., prewired, single-circuit, supervisory switch.
3. Indicator: Electrical 115 volts a.c., prewired, 2-circuit, supervisory switch.

D. Gate Valves, 2-1/2 Inches (DN 65) and Larger: UL 262, iron body, bronze mounted, taper wedge, outside screw and yoke, rising stem. Include replaceable, bronze, wedge facing rings and flanged ends.

E. Gate Valves, 2-1/2 Inches (DN 65) and Larger for Use with Indicator Posts: UL 262, iron body, bronze mounted, solid wedge disc, non-rising stem with operating nut and flanged ends.

F. Indicator Posts: UL 789, wall type, cast-iron body, with windows for target plates that indicate valve position, extension rod and coupling, locking device, and red enamel finish.

1. Operation: Operating wrench.
2. Operation: Hand wheel.

G. Swing Check Valves, 2-1/2 Inches (DN 65) and Larger: UL 312, cast-iron body and bolted cap, with bronze disc or cast-iron disc with bronze disc ring and flanged ends.

H. Butterfly Check Valves, 4 Inches (DN 100) and Larger: UL 213, split-clapper style, cast-iron body with rubber seal, bronze alloy discs, stainless-steel spring and hinge pin.

2.7 SPECIALTY VALVES

A. Alarm Check Valves: UL 193, 175 psig (1200 kPa) working pressure, designed for horizontal or vertical installation, with cast-iron flanged inlet and outlet, bronze grooved seat with O-ring seals, and single-hinge pin and latch design. Include trim sets for bypass, drain, electric sprinkler alarm switch, pressure gages, precision retarding chamber, and fill line attachment with strainer.

1. Drip Cup Assembly: Pipe drain without valves, and separate from main drain piping.

2. Drip Cup Assembly: Pipe drain with check valve to main drain piping.
3. Option: Grooved-end connections for use with grooved-end piping.

B. Alarm Check Valves: UL 193, 175 psig (1200 kPa) working pressure, designed for horizontal or vertical installation, with cast-iron flanged inlet and outlet, bronze grooved seat with O-ring seals, and single-hinge pin and latch design. Provide trim sets for bypass, drain, electric sprinkler alarm switch, pressure gages, drip cup assembly piped without valves separate from main drain line, and fill line attachment with strainer.

1. Option: Grooved-end connections for use with grooved-end piping.

C. Dry-Pipe Valves: UL 260, differential type, 175 psig (1200 kPa) working pressure, with cast-iron flanged inlet and outlet, bronze seat with O-ring seals, and single-hinge pin and latch design. Include UL 1486, quick-opening devices, trim sets for air supply, drain, priming level, alarm connections, ball drip valves, pressure gages, priming chamber attachment, and fill line attachment.

1. Option: Grooved-end connections for use with grooved-end piping.

D. Air-Pressure Maintenance Devices for Dry-Pipe Systems: Automatic device to maintain correct air pressure in dry-pipe system or deluge system. Include shutoff valves to permit servicing without shutting down sprinkler system, bypass valve for quick system filling, pressure regulator or switch to maintain system pressure, strainer, pressure ratings 14 psig (95 kPa) to 60 psig (410 kPa) adjustable range, and 175 psig (1200 kPa) maximum inlet pressure.

1. Air Compressor: Fractional horsepower, 120 volts a.c., 60 Hz, single phase.
2. Compressed Air or Nitrogen Supply: 1 cylinder with valves.

E. Deluge Valves: UL 260, cast-iron body, 175 psig (1200 kPa) working pressure, hydraulically operated, differential-pressure-type valve. Valves shall have flanged inlet and outlet, and bronze seat with O-ring seals. Include trim sets for bypass, drain, electric sprinkler alarm switch, pressure gages, drip cup assembly piped without valves separate from main drain line, fill line attachment with strainer, and push rod chamber supply connection.

1. Option: Grooved-end connections for use with grooved-end piping.
2. Include pilot line trim as follows:

a. Wet pilot line trim set including gage to read push rod chamber pressure, globe valve for manual operation of deluge valve, and connection for actuation device.

b. Dry pilot line trim set including dry pilot actuator, air and water pressure gages, low air pressure warning switch, air relief valve, and actuation device. Dry pilot line actuator includes cast iron, 175 psig (1200 kPa) working pressure, air operated, diaphragm-type valve with resilient facing plate, resilient diaphragm, and replaceable bronze seat. Valve includes threaded water and air inlets and water outlet. Loss of air pressure on dry pilot line side allows pilot line actuator to open and causes deluge valve to open immediately.

F. Pressure-Regulating Valves: UL 1468, 400 psig (2760 kPa) minimum rating, brass, pressure-regulating type. Include female NPS inlet and outlet and adjustable setting feature. Size 1-1/2 inches (DN 40) or 2-1/2 inches (DN 65), and straight or 90 degree angle (1.57 rad) pattern design as indicated.

1. Optional Finish: Rough chrome plate.

G. Ball Drip Valves: UL 1726, automatic drain valve, 3/4-inch (DN 20) size, spring-loaded, ball check device with threaded ends.

H. Detector Check Valves: UL 213, galvanized cast-iron body, bolted cover with air bleed device for access to internal parts, and flanged ends; designed for 175 psig (1200 kPa) working pressure. Include 1-piece bronze disc with bronze bushings, pivot, and replaceable seat. Include threaded bypass taps in the inlet and outlet for bypass meter connection. Set valve to allow minimal water flow through bypass meter when major water flow is required.

1. Water Meter: AWWA C700, disc type, of size and end connections at least one-fourth those of detector check valve. Include meter, bypass piping, gate valves, check valve, and connections to detector check valve.

2.8 MANUAL CONTROL STATIONS

A. Manual Control Stations: Hydraulic operation, with union, 1/2-inch (DN 15) pipe nipple, and bronze ball valve. Include metal enclosure labeled "MANUAL CONTROL STATION" with operating instructions and a cover held closed by breakable strut to prevent accidental opening. Cover must be replaced after each opening.

2.9 BACKFLOW PREVENTERS

A. General: ASSE standard backflow preventers, of size indicated for maximum flow rate indicated and maximum pressure loss indicated.

1. Working Pressure: 150 psig (1035 kPa) minimum except where indicated otherwise.
2. Bronze, cast-iron, steel, or stainless-steel body with flanged ends.
3. Interior Lining: FDA-approved epoxy coating, for backflow preventers having cast-iron or steel body.
4. Interior Components: Corrosion-resistant materials.
5. Strainer on inlet, where strainer is indicated.

B. Reduced-Pressure-Principle Backflow Preventer: ASSE 1013, consisting of OS&Y gate valves on inlet and outlet and strainer on inlet. Include test cocks and pressure-differential relief valve with ASME A112.1.2 air-gap fitting located between 2 positive-seating check valves for continuous pressure application.

1. Pressure Loss: 12 psig (83 kPa) maximum, through middle third of flow range.

C. Double-Check Backflow Prevention Assemblies: ASSE 1015, consisting of shutoff valves on inlet and outlet and strainer on inlet. Include test cocks with 2 positive-seating check valves for continuous pressure application.

1. Pressure Loss: 5 psig (35 kPa) maximum, through middle third of flow range.

D. Reduced-Pressure Detector Assembly Backflow Preventers: UL 312 and ASSE 1047, consisting of OS&Y gate valves on inlet and outlet, and strainer on inlet. Include pressure-differential relief valve having ASME A112.1.2 air-gap fitting located between 2 positive-seating check valves, test cocks, and bypass with displacement-type water meter, valves, and reduced-pressure backflow preventer, for continuous pressure application.

1. Pressure Loss: 12 psig (83 kPa) maximum, through middle third of flow range.

E. Double-Check Detector Assembly Backflow Preventers: UL 312 and ASSE 1048, consisting of OS&Y gate valves on inlet and outlet and strainer on inlet. Include 2 positive-seating check

valves and test cocks, and bypass with displacement-type water meter, valves, and double-check backflow preventer, for continuous pressure application.

1. Pressure Loss: 5 psig (35 kPa) maximum, through middle third of flow range.

2.10 EXCESS PRESSURE PUMPS

A. Description: UL-listed, factory-fabricated, positive-displacement, gear-type pump assembly. Include controls, wet-pipe kit, switches, pipe fittings, valves, mounting brackets, and connections for power, hydraulic piping, and wiring from alarm devices. Characteristics are:

1. Pump and Motor: Directly connected.
2. Motor Control: By differential pressure switch.
3. Lights: To indicate sprinkler system operating condition:

   a. White Light: Pressure is normal.
   b. Red Light: Pressure is low.

4. Pump Capacity: Approximately 1 GPM (63 mL/s).
5. Pump Discharge Head: Approximately 130 psig (900 kPa), and limited to 175 psig (1200 kPa) maximum.
6. Motor: 1/4 horsepower, 115 volts a.c., 60 Hz (187 W, 115 volts a.c., 60 Hz).

2.11 SPRINKLERS

A. Automatic Sprinklers: With heat-responsive element conforming to:

1. UL 199, for applications except residential.
2. UL 1626, for residential applications.
3. UL 1767, for early-suppression, fast-response applications.

B. Sprinkler types and categories are as indicated and as required by application. Furnish automatic sprinklers with nominal 1/2-inch (12.7-mm) orifice for "Ordinary" temperature classification rating except where otherwise indicated and required by application.

C. Open Sprinklers: UL 199, without heat-responsive element.

1. Orifice: 1/2-inch (12.7-mm), with discharge coefficient K between 5.3 and 5.8.
2. Orifice: 17/32-inch (13.5-mm), with discharge coefficient K between 7.4 and 8.2.

D. Sprinkler types, features, and options include:

1. Coated, painted, or plated sprinklers.
2. Concealed ceiling sprinklers, including cover plate.
3. Extended coverage sprinklers.
4. Flow-control sprinklers.
5. Flush ceiling sprinklers, including escutcheon.
6. Open sprinklers.
7. Pendent sprinklers.
8. Pendent, dry-type sprinklers.
9. Quick-response sprinklers.
10. Recessed sprinklers, including escutcheon.
11. Sidewall sprinklers.
12. Sidewall, dry-type sprinklers.

13. Upright sprinklers.

E. Sprinkler Finishes: Chrome-plated, bronze, and painted.

F. Special Coatings: Wax, lead, and corrosion-resistant paint.

G. Sprinkler Escutcheons: Materials, types, and finishes for following sprinkler mounting applications. Escutcheons for concealed, flush, and recessed-type sprinklers are specified with sprinklers.

1. Ceiling Mounting: Chrome-plated steel, 1-piece, flat.
2. Ceiling Mounting: Chrome-plated steel, 2-piece, with 1-inch (24-mm) vertical adjustment.
3. Ceiling Mounting: Plastic, white finish, 1-piece, flat.
4. Sidewall Mounting: Chrome-plated steel, 1-piece, flat.
5. Sidewall Mounting: Plastic, white finish, 1-piece, flat.

H. Sprinkler Guards: Wire-cage type, including fastening device for attaching to sprinkler.

I. Sprinkler Cabinets: Finished steel cabinet and hinged cover, with space for minimum of 6 spare sprinklers plus sprinkler wrench, suitable for wall mounting. Include number of sprinklers required by NFPA 13 and 1 wrench for sprinklers. Include separate cabinet with sprinklers and wrench for each style sprinkler on Project.

2.12 SPECIALTY SPRINKLER FITTINGS

A. Specialty Fittings: UL-listed and FM-approved, made of steel, ductile iron, or other materials compatible with system materials and applications where used.

1. Dry-Pipe-Systems Fittings: UL-listed for dry-pipe service.

B. Press-Seal Fittings: UL 213, carbon-steel housing with butylene O-rings and pipe stop, for use with plain-end, Schedule 5 steel pipe.

C. Locking-Lug Fittings: UL 213, ductile-iron body with locking-lug ends, for use with plain-end steel pipe.

D. Mechanical-"T" Fittings: UL 213, ductile-iron housing with pressure-responsive gasket, bolts, and threaded or locking-lug outlet.

E. Mechanical-Cross Fittings: UL 213, ductile-iron housing with pressure-responsive gaskets, bolts, and threaded or locking-lug outlets.

F. Drop-Nipple Fittings: UL 1474, with threaded inlet, threaded outlet, and seals; adjustable.

G. Sprinkler Alarm Test Fittings: Ductile-iron housing with 1-1/2-inch (40-mm) inlet and outlet, integral test valves, combination orifice and sight glass, and threaded or locking-lug ends.

2.13 NONADJUSTABLE HOSE VALVES

A. General: UL 668, 300 psig (2070 kPa) minimum rating, brass, nonadjustable type, hose valve for connection of fire hose. Include 90 degree angle (1.57 rad) pattern design, female NPS inlet and male hose outlet, and lugged cap, gasket, and chain. Size 1-1/2 inches (DN 40) or 2-1/2 inches (DN 65) as indicated. Hose valve threads are according to NFPA 1963 and match local fire department threads.

1. Finish: Polished brass.
2. Finish: Rough chrome plated.
3. Finish: Polished chrome plated.

2.14 PRESSURE-REGULATING HOSE VALVES

A. General: UL 1468, 400 psig (2760 kPa) minimum rating, brass, pressure-regulating type hose valve for connection of fire hose. Include 90 degree angle (1.57 rad) pattern design, female NPS inlet and male hose outlet, and lugged cap, gasket, and chain. Size 1-1/2 inches (DN 40) or 2-1/2 inches (DN 65) as indicated. Hose valve threads are according to NFPA 1963 and match local fire department threads.

1. Finish: Polished brass.
2. Finish: Rough chrome plated.
3. Finish: Polished chrome plated.

2.15 HOSE RACKS AND HOSES

A. General: UL 47, semiautomatic hose rack assembly. UL 668, 300 psig (2070 kPa) minimum rating, brass, nonadjustable-type hose valve. Include 90 degree angle (1.57 rad) pattern design valve, with NPS female inlet and outlet, brass rack nipple and hose rack, lined fire hose, couplings, gaskets, and nozzle. Include pipe clamp or wall bracket for freestanding unit; pipe escutcheon for cabinet-mounted unit; automatic drain valve; and brass, adjustable, flow-restricting device where indicated. Hose is lined type according to NFPA 1961. Hose couplings are according to UL 236, and threads and gaskets are according to NFPA 1963. Hose threads match local fire department threads. Nozzles are according to UL 401. Automatic drain valves are according to UL 1726.

1. Hose Jacket Material: Natural thread.
2. Hose Jacket Material: Synthetic thread.
3. Hose Jacket Material: Combination of natural and synthetic thread.
4. Hose Lining: Rubber compound.
5. Hose Lining: Thermoplastic material.
6. Hose Lining: Blends of rubber compound and thermoplastic material.
7. Hose Lining: Natural rubber-latex-coated fabric.

B. 2-1/2-Inch (DN 65) Valve/1-1/2-Inch (DN 40) Hose Stations: Include 2-1/2-inch (DN 65) valve, 2-1/2-inch (DN 65) by 1-1/2-inch (DN 40) reducer, hose rack with water retention device and pins for folded hose, 1-1/2-inch (DN 40) lined hose with swivel inlet coupling, nozzle, and spanner wrench for removal of reducing coupling.

1. Hose Rack Finish: Red enamel.
2. Valve and Trim Finish: Rough brass.
3. Hose Rack Finish: Polished chrome plated.
4. Valve and Trim Finish: Rough chrome plated.
5. Hose Rack Finish: Polished chrome plated.
6. Valve and Trim Finish: Polished chrome plated.

7. Fire Hose: Lined, 50 foot (15 m) length.
8. Fire Hose: Lined, 75 foot (23 m) length.
9. Fire Hose: Lined, 100 foot (30 m) length.
10. Fire Hose: Lined, 125 foot (38 m) length.
11. Nozzle: Brass, adjustable from shutoff to fog spray to straight stream.

12. Nozzle: Polycarbonate plastic, adjustable from shutoff to fog spray to straight stream.
13. Nozzle: Brass, plain type.
14. Nozzle: Brass, adjustable fog, designed for use on electrical fires.

15. Adjustable Restricting Device: Include where indicated.

C. 1-1/2-Inch (DN 40) Valve/1-1/2-Inch (DN 40) Hose Stations: Include 1-1/2-inch (DN 40) valve, hose rack with water retention device and pins for folded hose, 1-1/2-inch (DN 40) lined hose with swivel inlet coupling, and nozzle.

1. Hose Rack Finish: Red enamel.
2. Valve and Trim Finish: Rough brass.
3. Hose Rack Finish: Polished chrome plated.
4. Valve and Trim Finish: Rough chrome plated.
5. Hose Rack Finish: Polished chrome plated.
6. Valve and Trim Finish: Polished chrome plated.

7. Fire Hose: Lined, 50 foot (15 m) length.
8. Fire Hose: Lined, 75 foot (23 m) length.
9. Fire Hose: Lined, 100 foot (30 m) length.
10. Fire Hose: Lined, 125 foot (38 m) length.
11. Nozzle: Brass, adjustable from shutoff to fog spray to straight stream.
12. Nozzle: Polycarbonate plastic, adjustable from shutoff to fog spray to straight stream.
13. Nozzle: Brass, plain type.
14. Nozzle: Brass, adjustable fog, designed for use on electrical fires.

15. Adjustable Restricting Device: Include where indicated.

D. 2-1/2-Inch (DN 65) Hose Valve and 1-1/2-Inch (DN 40) Valve/1-1/2-Inch (DN 40) Hose Stations: Include 1-1/2-inch (DN 40) valve, hose rack with water retention device and pins for folded hose, 1-1/2-inch (DN 40) lined hose with swivel inlet coupling, nozzle, and separate 2-1/2-inch (DN 65) hose valve with male threaded outlet, cap, and chain.

1. Hose Rack Finish: Red enamel.
2. Valve and Trim Finish: Rough brass.
3. Hose Rack Finish: Polished chrome plated.
4. Valve and Trim Finish: Rough chrome plated.
5. Hose Rack Finish: Polished chrome plated.
6. Valve and Trim Finish: Polished chrome plated.

7. Fire Hose: Lined, 50 foot (15 m) length.
8. Fire Hose: Lined, 75 foot (23 m) length.
9. Fire Hose: Lined, 100 foot (30 m) length.
10. Fire Hose: Lined, 125 foot (38 m) length.
11. Nozzle: Brass, adjustable from shutoff to fog spray to straight stream.
12. Nozzle: Polycarbonate plastic, adjustable from shutoff to fog spray to straight stream.
13. Nozzle: Brass, plain type.
14. Nozzle: Brass, adjustable fog, designed for use on electrical fires.

15. Adjustable Restricting Device: Include where indicated.

16. 2-1/2-Inch (DN 65) Hose Valve: UL 668, 300 psig (2070 kPa) minimum rating, brass, nonadjustable type, with finish same as 1-1/2-inch (DN 40) valve.

17. 2-1/2-Inch (DN 65) Hose Valve: UL 668, 300 psig (2070 kPa) minimum rating, brass, pressure-regulating type, with finish same as 1-1/2-inch (DN 40) valve.

2.16 FIRE DEPARTMENT CONNECTIONS

A. Flush, Wall-Type Fire Department Connections: UL 405, cast-brass body; NH-standard thread inlets according to NFPA 1963 and matching local fire department threads; and threaded NPS outlet. Include lugged cap, gasket, and chain; lugged swivel connection, extension pipe nipples, and clappers for each hose connection inlet; and wall escutcheon plate with marking "AUTO SPKR & STANDPIPE."

1. Connections: One 2-1/2-inch (DN 65) inlet and 2-1/2-inch (DN 65) outlet.
2. Connections: One 2-1/2-inch (DN 65) inlet and 3-inch (DN 80) outlet.
3. Connections: Two 2-1/2-inch (DN 65) inlets and 4-inch (DN 100) outlet.
4. Connections: Two 2-1/2-inch (DN 65) inlets and 6-inch (DN 150) outlet.
5. Connections: Three 2-1/2-inch (DN 65) inlets and 6-inch (DN 150) outlet.
6. Connections: Four 2-1/2-inch (DN 65) inlets and 6-inch (DN 150) outlet.
7. Connections: Six 2-1/2-inch (DN 65) inlets and 6-inch (DN 150) outlet.
8. Connections: Six 2-1/2-inch (DN 65) inlets and 8-inch (DN 200) outlet.

9. Inlet Alignment: In line, horizontal.
10. Inlet Alignment: In line, vertical.
11. Inlet Alignment: Square.
12. Clapper Type: Drop clappers in body.
13. Clapper Type: Female clapper snoots.
14. Clapper Type: Check snoots.
15. Direction of Outlet: Back.
16. Direction of Outlet: Top.
17. Direction of Outlet: Bottom.
18. Direction of Outlet: End.
19. Escutcheon Plate: Round.
20. Escutcheon Plate: Square.
21. Escutcheon Plate: Rectangular.
22. Finish: Polished chrome plated.
23. Finish: Rough chrome plated.
24. Finish: Polished brass.

B. Exposed, Wall-Type Fire Department Connections: UL 405, cast-brass body; NH-standard thread inlets according to NFPA 1963 and matching local fire department threads; and threaded NPS outlet. Include lugged cap, gasket, and chain; lugged swivel connection and drop clappers for each hose connection inlet; and round wall escutcheon plate with marking "AUTO SPKR & STANDPIPE."

1. Connections: Two 2-1/2-inch (DN 65) inlets and 4-inch (DN 100) outlet.
2. Connections: Two 2-1/2-inch (DN 65) inlets and 6-inch (DN 150) outlet.
3. Connections: Three 2-1/2-inch (DN 65) inlets and 6-inch (DN 150) outlet.
4. Direction of Outlet: Back, straight.
5. Direction of Outlet: Back, angle.
6. Finish: Polished chrome plated.
7. Finish: Rough chrome plated.
8. Finish: Polished brass.

C. Exposed, Sidewalk Fire Department Connections: UL 405, cast-brass body; NH-standard thread inlets according to NFPA 1963 and matching local fire department threads; and threaded

NPS bottom outlet. Include lugged cap, gasket, and chain; lugged swivel connection and drop clappers for each hose connection inlet; 18-inch (460-mm) high brass sleeve; and round sidewalk escutcheon plate with marking "AUTO SPKR & STANDPIPE."

1. Connections: Two 2-1/2-inch (DN 65) inlets and 4-inch (DN 100) outlet.
2. Connections: Two 2-1/2-inch (DN 65) inlets and 6-inch (DN 150) outlet.
3. Connections: Three 2-1/2-inch (DN 65) inlets and 6-inch (DN 150) outlet.
4. Connections: Four 2-1/2-inch (DN 65) inlets and 6-inch (DN 150) outlet.
5. Connections: Six 2-1/2-inch (DN 65) inlets and 6-inch (DN 150) outlet.
6. Connections: Six 2-1/2-inch (DN 65) inlets and 8-inch (DN 200) outlet.
7. Inlet Alignment: In line, horizontal.
8. Inlet Alignment: Square.
9. Finish, Including Sleeve: Polished chrome plated.
10. Finish, Including Sleeve: Rough chrome plated.
11. Finish, Including Sleeve: Polished brass.

2.17 ALARM DEVICES

A. Alarm Devices: Types and sizes that will match piping and equipment connections.

B. Water-Motor-Operated Alarms: UL 753, mechanical operation type, 10-inch (250-mm) diameter, cast-aluminum alarm gong, with red enamel factory finish. Include Pelton-wheel-type operator with nylon shaft bearings, and shaft length and sleeve to suit wall thickness and construction; 3/4-inch (DN 20) inlet and 1-inch (DN 25) drain.

C. Waterflow Indicators: UL 346, electrical-supervision type, vane-type waterflow detector, rated to 250 psig (1725 kPa), and designed for horizontal or vertical installation. Include 2 SPDT (single-pole, double-throw) circuit switches to provide isolated alarm and auxiliary contacts, 7 ampere, 125 volts a.c. and 0.25 ampere, 24 volts d.c.; complete with factory-set, field-adjustable retard element to prevent false signals and tamper-proof cover that sends a signal when cover is removed.

D. Pressure Switches: UL 753, waterflow switch with retard, electrical-supervision type, SPDT (single-pole, double-throw), normally closed contacts, designed to operate on rising pressure and signal water flow.

E. Supervisory Switches: UL 753, for valves, electrical-supervision type, SPDT (single-pole, double-throw), normally closed contacts, designed to signal controlled valve in other than full open position.

F. Supervisory Switches: UL 753, for indicator posts, electrical-supervision type, SPDT (single-pole, double throw), normally closed contacts, designed to signal controlled valve in other than full open position.

2.18 PRESSURE GAGES

A. Pressure Gages: UL 393, 3-1/2 to 4-1/2 inches (90 to 115 mm) diameter dial with dial range of 0-250 psig (0-1600 kPa).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for hose valves, hose racks, and cabinets to verify actual locations of piping connections prior to installing cabinets.

B. Examine walls and partitions for suitable thickness, fire- and smoke-rated construction, framing for cabinets, and other conditions where cabinets are to be installed.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 SPRINKLER SYSTEM PIPING APPLICATIONS

A. Refer to Part 2 of this Section for detailed specifications on pipe and fittings products listed below. Use pipe, tube, fittings, and joining methods according to the following applications. Piping may be joined with flanges instead of indicated joints. Use grooved-end fittings with grooved couplings that are made by the same manufacturer and that comply with listing when used together for grooved-coupling joints.

1. Option: Mechanical-"T" bolted-branch-outlet fittings, instead of fitting types specified, may be used for branch connections.
2. Option: Specialty sprinkler fittings, including mechanical-"T" fittings, may be used instead of specified fittings downstream of zone valves.

B. Pipe Between Fire Department Connections and Check Valves: Use galvanized-steel pipe instead of black-steel pipe when steel pipe is specified for applications below. Do not use welded joints.

C. Sizes 2 Inches (DN 50) and Smaller: ASTM A 53, A 135, or A 795; Schedule 40 steel pipe with threaded ends, cast-iron or malleable-iron threaded fittings, and threaded joints.

D. Sizes 2 Inches (DN 50) and Smaller: ASTM A 135, threadable, lightwall steel pipe with threaded ends, cast-iron or malleable-iron threaded fittings, and threaded joints.

E. Sizes 2 Inches (DN 50) and Smaller: ASTM A 135 or ASTM A 795, Schedule 10 steel pipe, welding-type fittings, and welded joints.

F. Sizes 2 Inches (DN 50) and Smaller: ASTM A 53, A 135, or A 795; Schedule 40 steel pipe with cut-groove ends, grooved-end steel pipe fittings, and grooved-coupling joints.

G. Sizes 2 Inches (DN 50) and Smaller: ASTM A 53, A 135, or A 795; Schedule 40 steel pipe with rolled-groove ends, grooved-end steel pipe fittings, and grooved-coupling joints.

H. Sizes 2 Inches (DN 50) and Smaller: ASTM A 135 or ASTM A 795, Schedule 10 steel pipe with rolled-groove ends, grooved-end steel pipe fittings, and grooved-coupling joints.

I. Sizes 2 Inches (DN 50) and Smaller: ASTM A 135 or ASTM A 795, Schedule 5 steel pipe, steel press-seal fittings, and press-seal joints.

J. Sizes 2 Inches (DN 50) and Smaller: Type L (Type B) copper tube, wrought-copper fittings, and brazed joints.

1. Fittings Option: Mechanically formed outlets with brazed joints.

K. Sizes 2 Inches (DN 50) and Smaller: Type M (Type C) copper tube, wrought-copper fittings, and brazed joints.

L. Sizes 2 Inches (DN 50) and Smaller: Chlorinated polyvinyl chloride (CPVC) plastic pipe and fittings, with solvent-cemented joints and metal-to-plastic transition fittings.

M. Sizes 2 Inches (DN 50) and Smaller: Polybutylene (PB) plastic pipe and fittings, with socket-fusion joints and metal-to-plastic transition fittings.

N. Sizes 2-1/2 Inches (DN 65) to 6 Inches (DN 150): ASTM A 53, A 135, or A 795; Schedule 40 steel pipe with threaded ends, cast-iron or malleable-iron threaded fittings, and threaded joints.

O. Sizes 2-1/2 Inches (DN 65) to 6 Inches (DN 150): ASTM A 53, A 135, or A 795; Schedule 40 steel pipe, welding type steel fittings, and welded joints.

P. Sizes 2-1/2 Inches (DN 65) to 6 Inches (DN 150): ASTM A 53, A 135, or A 795; Schedule 40 steel pipe with cut-groove ends, grooved-end steel pipe fittings, and grooved-coupling joints.

Q. Sizes 2-1/2 Inches (DN 65) to 6 Inches (DN 150): ASTM A 53, A 135, or A 795; Schedule 40 steel pipe with rolled-groove ends, grooved-end steel pipe fittings, and grooved-coupling joints.

R. Sizes 2-1/2 Inches (DN 65) to 6 Inches (DN 150): ASTM A 135 or A 795, Schedule 10 steel pipe with rolled-groove ends, grooved-end steel pipe fittings, and grooved-coupling joints.

S. Sizes 2-1/2 Inches (DN 65) to 6 Inches (DN 150): Type L (Type B) copper tube with rolled-groove ends, copper tube grooved-end fittings, copper tube grooved couplings, and grooved-coupling joints.

1. Fittings and Joining Option to 4 Inches (DN 100): Wrought-copper fittings and brazed joints.
2. Fittings Option to 4 Inches (DN 100): Mechanically formed outlets and brazed joints.

T. Sizes 8 Inches (DN 200) and Larger: ASTM A 53 or A 795, Schedule 30 steel pipe, welding-type steel fittings, and welded joints.

U. Sizes 8 Inches (DN 200) and Larger: ASTM A 53 or A 795, Schedule 30 steel pipe with cut-groove ends, steel pipe grooved-end fittings, grooved couplings, and grooved-coupling joints.

V. Sizes 8 Inches (DN 200) and Larger: ASTM A 53 or A 795, Schedule 30 steel pipe with rolled-groove ends, steel pipe grooved-end fittings, grooved couplings, and grooved-coupling joints.

3.3 STANDPIPE SYSTEM PIPING APPLICATIONS

A. Refer to Part 2 of this Section for detailed specifications for pipe and fittings products listed below. Use pipe, tube, fittings, and joining methods according to the following applications. Piping may be joined with flanges instead of indicated joints. Use grooved-end fittings with grooved couplings that are made by the same manufacturer and that comply with listing when used together for grooved-coupling joints.

B. Pipe Between Fire Department Connections and Check Valves: Use galvanized-steel pipe instead of black-steel pipe when steel pipe is specified for applications below. Do not use welded joints.

C. Sizes Smaller Than 4 Inches (DN 100): ASTM A 53, A 135, or A 795; Schedule 40 steel pipe with threaded ends, cast-iron or malleable-iron threaded fittings, and threaded joints.

D. Sizes Smaller Than 4 Inches (DN 100): ASTM A 53, A 135, or A 795; Schedule 40 steel pipe, welding type steel fittings, and welded joints.

E. Sizes Smaller Than 4 Inches (DN 100): ASTM A 53, A 135, or A 795; Schedule 40 steel pipe with cut-groove ends, steel pipe grooved-end fittings, steel pipe grooved couplings, and grooved-coupling joints.

F. Sizes Smaller Than 4 Inches (DN 100): ASTM A 53, A 135, or A 795; Schedule 40 steel pipe with rolled-groove ends, steel pipe grooved-end fittings, steel pipe grooved couplings, and grooved-coupling joints.

G. Sizes Smaller Than 4 Inches (DN 100): ASTM A 135 or A 795, Schedule 10 steel pipe with rolled-groove ends, steel pipe grooved-end fittings, steel pipe grooved couplings, and grooved-coupling joints.

H. Sizes Smaller Than 4 Inches (DN 100): Type L (Type B), copper tube with rolled-groove ends, copper tube grooved-end fittings, copper tube grooved couplings, and grooved-coupling joints.

I. Sizes Smaller Than 4 Inches (DN 100): Type L (Type B), copper tube, copper solder-joint fittings, and brazed joints.

J. Sizes 4 Inches (DN 100) to 6 Inches (DN 150): ASTM A 53, A 135, or A 795; Schedule 40 steel pipe with plain ends, welding-type steel fittings, and welded joints.

K. Sizes 4 Inches (DN 100) to 6 Inches (DN 150): ASTM A 53, A 135, or A 795; Schedule 40 steel pipe with cut-groove ends, steel pipe grooved-end fittings, steel pipe grooved couplings, and grooved-coupling joints.

L. Sizes 4 Inches (DN 100) to 6 Inches (DN 150): ASTM A 53, A 135, or A 795; Schedule 40 steel pipe with rolled-groove ends, steel pipe grooved-end fittings, steel pipe grooved couplings, and grooved-coupling joints.

M. Sizes 4 Inches (DN 100) to 6 Inches (DN 150): ASTM A 795 or A 135, Schedule 10 steel pipe with rolled-groove ends, steel pipe grooved-end fittings, steel pipe grooved couplings, and grooved-coupling joints.

N. Sizes 4 Inches (DN 100) to 6 Inches (DN 150): Type L (Type B) copper tube with rolled-groove ends, copper tube grooved-end fittings, copper tube grooved couplings, and grooved-coupling joints.

O. Sizes 4 Inches (DN 100) to 6 Inches (DN 150): Type L (Type B) copper tube, copper solder-joint fittings, and brazed joints.

P. Sizes 4 Inches (DN 100) to 6 Inches (DN 150): Ductile-iron pipe with flanged ends, flanged ductile-iron or cast-iron fittings, and flanged joints.

Q. Sizes 4 Inches (DN 100) to 6 Inches (DN 150): Ductile-iron pipe with cut-groove ends, grooved-end ductile-iron or malleable-iron fittings, ductile-iron pipe grooved couplings, and grooved-coupling joints.

R. Sizes 8 Inches (DN 200) and Larger: ASTM A 53 or A 795, Schedule 30 steel pipe with plain ends, steel welding-type fittings, and welded joints.

S. Sizes 8 Inches (DN 200) and Larger: ASTM A 53 or A 795, Schedule 30 steel pipe with cut-groove ends, steel pipe grooved-end fittings, steel pipe grooved couplings, and grooved-coupling joints.

T. Sizes 8 Inches (DN 200) and Larger: ASTM A 53 or A 795, Schedule 30 steel pipe with rolled-groove ends, steel pipe grooved-end fittings, steel pipe grooved couplings, and grooved-coupling joints.

U. Sizes 8 Inches (DN 200) and Larger: Ductile-iron pipe with flanged ends, flanged ductile-iron or cast-iron fittings, and flanged joints.

V. Sizes 8 Inches (DN 200) and Larger: Ductile-iron pipe with cut-groove ends, grooved-end ductile-iron or malleable-iron fittings, ductile-iron pipe grooved couplings, and grooved-coupling joints.

3.4 VALVE APPLICATIONS

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use gate, ball, or butterfly valves.
2. Throttling Duty: Use globe, ball, or butterfly valves.

3.5 JOINT CONSTRUCTION

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.

B. Grooved-End Pipe and Grooved-End Fitting Joints: Use grooved-end fittings and grooved couplings that are made by the same manufacturer and that are listed for use together. Groove pipe and assemble joints with grooved coupling, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.

1. Dry-Pipe-Systems Gaskets: UL-listed for dry-pipe service.

2. Groove Type: Cut.
3. Groove Type: Rolled.

C. Grooved-End Copper Tube and Grooved-End Fitting Joints: Use grooved-end fittings and grooved couplings that are made by the same manufacturer and that are listed for use together. Roll-groove tube and assemble joints with grooved coupling, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.

1. Dry-Pipe-Systems Gaskets: UL-listed for dry-pipe service.

D. Brazed Joints: Use AWS A5.8, BCuP-3, or BCuP-4 filler metals.

E. Mechanically Formed Outlet Joints: Use UL-listed procedure and follow forming equipment manufacturer's written instructions. Drill pilot hole in tube, form branch for collar, dimple tube to form seating stop, and braze branch tube into formed-collar outlet.

F. Press-Seal Fitting Joints: Follow manufacturer's written instructions, including use of specific equipment, pressure sealing tool, and accessories made for this procedure.

G. Locking-Lug Joints: Follow manufacturer's written instructions.

H. Dissimilar Materials Piping Joints: Make joints using adapters compatible with both piping materials.

I. Handling of Solvent Cements, Primers, and Cleaners: Comply with procedures in ASTM F 402 for safe handling when joining plastic pipe and fittings with solvent cements.

J. PB Heat-Fusion Joints: Conform to ASTM D 3309.

3.6 SERVICE ENTRANCE PIPING

A. Connect fire protection piping to water service piping of size and in location indicated for service entrance to building. Water service piping is specified in Division 2 Section "Water Systems."

B. Install shutoff valve, check valve, pressure gage, drain, and other accessories indicated at connection to water service piping.

C. Install shutoff valve, backflow preventer, pressure gage, drain, and other accessories indicated at connection to fire service piping.

3.7 WATER SUPPLY CONNECTION

A. Connect fire protection piping to water supply piping of size and in location indicated.

B. Install shutoff valve, check valve, pressure gage, drain, and other accessories indicated at connection to water supply piping.

C. Install shutoff valve, backflow preventer, pressure gage, drain, and other accessories indicated at connection to water supply piping.

3.8 PIPING INSTALLATIONS

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping installation.

B. Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate general location and arrangement of piping. Install piping as indicated, as far as practical.

1. Deviations from approved "working plans" for sprinkler piping require written approval from authority with jurisdiction. File written approval with the Architect prior to deviating from approved "working plans."

C. Use approved fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.

D. Install unions adjacent to each valve in pipes 2 inches (DN 50) and smaller. Unions are not required on flanged devices or in piping installations using grooved couplings.

E. Install flanges or flange adapters on valves, apparatus, and equipment having 2-1/2-inch (DN 65) and larger connections.

F. Install "Inspector's Test Connections" in sprinkler piping, complete with shutoff valve, sized and located according to NFPA 13.

G. Install sprinkler piping with drains for complete system drainage.

H. Install sprinkler zone control valves, test assemblies, and drain headers adjacent to standpipes when sprinkler piping is connected to standpipe.

I. Install drain valves on standpipe systems, of sizes and in locations indicated.

J. Install ball drip valves to drain piping between fire department connections and check valves, and where indicated. Drain to floor drain or outside building.

K. Install alarm devices in piping systems.

L. Hangers and Supports: Comply with NFPA 13. Install according to NFPA 13 and NFPA 14.

1. Install hanger and support spacing and locations for steel piping joined with grooved mechanical couplings according to manufacturer's written instructions for rigid systems.

2. Earthquake Protection: Install piping according to NFPA 13 to protect from earthquake damage.

M. Install pressure gages on riser or feed main, at each sprinkler test connection, and at top of each standpipe. Include pressure gages with connection not less than 1/4 inch (7 mm) and with soft metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they will not be subject to freezing.

3.9 SPECIALTY SPRINKLER FITTING INSTALLATIONS

A. Install specialty sprinkler fittings according to manufacturer's written instructions.

3.10 VALVE INSTALLATIONS

A. Refer to Division 15 Section "Valves" for installation of general-duty valves. Install fire-protection specialty valves, trim, fittings, controls, and specialties according to NFPA 13 and NFPA 14, manufacturer's written instructions, and the authority having jurisdiction.

B. Gate Valves: Install fire-protection service valves supervised-open, located to control sources of water supply except from fire department connections. Where there is more than 1 control valve, provide permanently marked identification signs indicating portion of system controlled by each valve.

C. Install check valve in each water supply connection. Install backflow preventers instead of check valves in potable water supply sources.

D. Alarm Check Valves: Install valves in vertical position for proper direction of flow, including bypass check valve and retard chamber drain line connection.

E. Dry-Pipe Valves: Install trim sets for air supply, drain, priming level, alarm connections, ball drip valves, pressure gages, priming chamber attachment, and fill line attachment.

F. Air-Pressure Maintenance Devices for Dry-Pipe Systems: Install shut-off valves to permit servicing without shutting down sprinkler system, bypass valve for quick system filling, pressure regulator or switch to maintain system pressure, strainer, pressure ratings 14 psig (95 kPa) to 60 psig (410 kPa) adjustable range, and 175 psig (1200 kPa) maximum inlet pressure.

1. Install air compressor and compressed air supply piping.
2. Install compressed air cylinder and compressed air supply piping.
3. Install compressed air supply piping from building compressed air piping system.
4. Install nitrogen cylinder and nitrogen supply piping.

G. Deluge Valves: Install in vertical position, in proper direction of flow, in main supply to deluge system.

H. Detector Check Valves: Install for proper direction of flow, located to detect system leakage and unauthorized use of water and to prevent backflow into public water mains. Install bypass with water meter, with gate valves on each side of meter, and check valve downstream from meter.

3.11 WATER METER INSTALLATION

A. Install water meter according to utility company's written installation instructions and requirements.

B. Size meter and arrange piping and specialties to comply with utility company's requirements.

C. Set meter on 3000-psi (20.7-MPa) minimum, Portland cement mix concrete pad, as indicated. Refer to Division 3 Section "Cast-In-Place Concrete" for requirements for formwork, reinforcement, and concrete.

3.12 ROUGHING-IN FOR WATER METER

A. Install roughing-in piping and specialties for water meter installation according to utility company's instructions and requirements.

3.13 BACKFLOW PREVENTER INSTALLATION

A. Install backflow preventers of type, size, and capacity indicated. Comply with plumbing code and authority with jurisdiction. Install air-gap fitting on units with atmospheric vent connection and pipe relief outlet drain to nearest floor drain. Do not install bypass around backflow preventer.

3.14 SPRINKLER APPLICATIONS

A. Rooms without Ceilings: Upright sprinklers.

B. Rooms without Ceilings: Pendent sprinklers.

C. Rooms without Ceilings: Upright and pendent sprinklers, as indicated.

D. Rooms with Suspended Ceilings: Pendent sprinklers.

E. Rooms with Suspended Ceilings: Recessed sprinklers.

F. Rooms with Suspended Ceilings: Flush sprinklers.

G. Rooms with Suspended Ceilings: Concealed sprinklers.

H. Rooms with Suspended Ceilings: Pendent, recessed, flush, and concealed sprinklers, as indicated.

I. Wall Mounting: Sidewall sprinklers.

J. Spaces Subject to Freezing: Upright, pendent dry-type, and sidewall dry-type sprinklers.

K. Deluge Sprinkler Systems: Upright and pendent, open sprinklers.

L. Special Applications: Use extended-coverage, flow-control, and quick-response sprinklers where indicated.

M. Sprinkler Finishes: Use sprinklers with following finishes:

1. Upright, Pendent, and Sidewall Sprinklers: Chrome-plated in finished spaces exposed to view; rough bronze in unfinished spaces not exposed to view; wax-coated where exposed to acids, chemicals, or other corrosive fumes.
2. Concealed Sprinklers: Rough brass, with factory-painted white cover plate.
3. Flush Sprinklers: Bright chrome, with painted white escutcheon.
4. Recessed Sprinklers: Bright chrome, with bright chrome escutcheon.
5. Residential Sprinklers: Dull chrome.

3.15 SPRINKLER INSTALLATIONS

A. Install sprinklers in patterns indicated.

B. Install sprinklers in suspended ceilings in center of acoustical panels and tiles.

C. Install sprinklers in suspended ceilings in center of narrow dimension of acoustical panels.

D. Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing. Use dry-type sprinklers supplied from heated space.

3.16 HOSE VALVE INSTALLATIONS

A. Hose Outlet Valves: Install 1-1/2 inch (40 mm) hose outlet valves at each standpipe outlet for hose connections for use by building occupants. Install 2-1/2 inch (65 mm) hose outlet valves at each standpipe outlet for hose connections for use by fire department.

B. Hose Outlet Valves: Install 2-1/2-inch (65-mm) hose outlet valves with quick-disconnect 2-1/2-inch (65-mm) to 1-1/2-inch (40-mm) reducing coupling and flow restriction device at each standpipe outlet for hose connections.

3.17 HOSE VALVE AND RACK AND HOSE INSTALLATIONS

A. Install freestanding hose valves and racks and hose assemblies for access and minimum passage restriction.

B. Free-Standing Hose Valves: Install 1-1/2-inch (40-mm) and 2-1/2-inch (65-mm) hose valves where indicated.

C. Free-Standing Racks and Hoses: Install racks and hose assemblies in locations indicated.

D. Cabinet-Mounted Hose Valves: Install 1-1/2-inch (40-mm) and 2-1/2-inch (65-mm) hose valves in cabinets specified in Division 10 Section "Fire Extinguishers, Cabinets, and Accessories" where indicated. Include pipe escutcheon with finish matching valve on supply pipe inside cabinet.

E. Cabinet-Mounted Racks and Hoses: Install in cabinets specified in Division 10 Section "Fire Extinguishers, Cabinets, and Accessories" in locations indicated. Include pipe escutcheon with finish matching valve, on supply pipe inside cabinet. Install flow-restricting device where indicated.

F. Include 2-1/2-inch (65-mm) by 1-1/2-inch (40-mm) reducer on 2-1/2-inch (65-mm) valves where indicated.

G. Install hose valves in cabinets at angle required for connection of fire hose.

3.18 EXCESS PRESSURE PUMP INSTALLATION

A. Install excess pressure pumps, controls, devices, and supports according to manufacturer's written installation instructions for wet-pipe sprinkler system application.

1. Mounting: Install mounted on wall, where indicated.
2. Mounting: Install attached to water supply pipe.

3.19 FIRE DEPARTMENT CONNECTION INSTALLATIONS

A. Install fire department connections of types and features indicated in locations indicated.

B. Install ball drip valves at each check valve for fire department connection to mains and where indicated. Drain to floor drain or outside building.

3.20 CONNECTIONS

A. Connect to specialty valves, hose valves, specialties, fire department connections, and accessories.

B. Connect water supplies to standpipe and sprinkler systems. Include backflow preventers.

C. Connect water supply piping to fire pump system piping. Fire pumps, pressure maintenance pumps, controllers, and accessories are specified in Division 15 Section "Fire Pumps."

D. Electrical Connections: Power wiring is specified in Division 16.

E. Connect alarm devices to fire alarm system.

F. Connect excess pressure pumps to following piping and wiring:

1. Hydraulically to sprinkler system.
2. Hydraulically to pressure gages and controls.
3. To electrical power system.
4. To alarm device accessories for pump.
5. To fire alarm system.

G. Connect compressed air supply to dry-pipe sprinkler system.

H. Connect air compressor to following piping and wiring:

1. To pressure gages and controls.
2. To electrical power system.
3. To fire alarm system devices, including low-pressure alarm.

3.21 FIELD QUALITY CONTROL

A. Perform field acceptance tests of each fire protection system.

1. Flush, test, and inspect sprinkler piping systems according to NFPA 13 Chapter "System Acceptance."
2. Flush, test, and inspect standpipe systems according to NFPA 14 Chapter "Tests and Inspection."

B. Replace piping system components that do not pass test procedures specified. Then retest to demonstrate compliance. Repeat procedure until satisfactory results are obtained.

1. Report test results promptly and in writing to Contracting Officer.

3.22 CLEANING

A. Clean dirt and debris from sprinklers. Replace sprinklers having paint other than factory finish with new sprinklers. Cleaning and reuse of painted sprinklers is prohibited.

3.23 COMMISSIONING

A. Starting Procedures: Follow manufacturer's written procedures. If no procedures are prescribed by manufacturer, proceed as follows:

1. Verify that specialty valves, trim, fittings, controls, and accessories have been installed correctly and operate correctly.
2. Verify that excess pressure pumps and accessories have been installed correctly and operate correctly.
3. Verify that air compressors and their accessories have been installed correctly and operate correctly.
4. Verify that specified tests of piping are complete.
5. Check that damaged sprinklers and sprinklers with paint or coating not specified have been replaced with new, correct type of sprinklers.
6. Check that sprinklers are correct type, have correct finish and temperature ratings, and have guards where required for applications.
7. Check that potable water supplies have correct type of backflow preventer.
8. Drain dry-pipe sprinkler systems.
9. Pressurize and check dry-pipe sprinkler systems air pressure maintenance devices, and air compressors.
10. Check that hose valves and fire department connections have threads compatible with local fire department equipment and have correct pressure rating.
11. Fill wet-pipe sprinkler systems with water.
12. Fill wet standpipe systems with water.
13. Check for correct type and size hose valves.
14. Check for correct type and size hose valves, racks, hoses, and nozzles.
15. Energize circuits to electrical equipment and devices.
16. Start and run excess pressure pumps.
17. Start and run air compressors.
18. Adjust operating controls and pressure settings.

B. Coordinate with fire alarm system tests. Operate systems as required.

C. Coordinate with fire pump tests. Operate systems as required.

3.24 DEMONSTRATION

A. Demonstrate equipment, specialties, and accessories. Review operating and maintenance information.

B. Schedule demonstration with at least 7 days' advance notice.

END OF SECTION 15325

SECTION 15720 - LOW PRESSURE DUCTWORK

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Removal of existing ductwork and air terminals and providing and installing new ductwork, duct insulation, dampers and/or air terminals as required on the Delivery Orders using materials and methods specified. herein. Generating pressure of 2" w.g. or less, negative.

B. Where ductwork is removed, opening in branch or main duct shall be patched. Patch shall consist of a sheet metal plate (same gauge as duct and one-inch larger in each direction than the opening) secured to duct with sheet metal screws (maximum one-inch on centers) and sealed with duct tape or neoprene gasket.

C. All removed ductwork, duct insulation, and air terminals that are not to be reused shall become the property of the Contractor and removed from the job site.

D. All existing insulation that is to remain but is disturbed or damaged shall be repaired to its original condition. Patches shall be insulated to essentially match existing insulation.

1.02 QUALITY ASSURANCE:

A. SMACNA Standards: Comply with SMACNA "Low Pressure Duct Construction Standards" for fabrication and installation of low pressure ductwork.

B. ASHRAE Standards: Comply with ASHRAE Handbook and Product Directory, 1979 Equipment Volume, Chapter 1 "Duct Construction", for fabrication and installation of low pressure ductwork.

C. NFPA Compliance: Comply with ANSI/NFPA 90A "Standard for the Installation of Air-Conditioning and Ventilating Systems" and ANSI/NFPA 90B "Standard for the Installation of Warm Air Heating and Air-Conditioning Systems."

D. Field Reference Manual: Have available at project field office, copy of "SMACNA Low Pressure Duct Construction Standards - 5th Edition".

1.03 SUBMITTALS:

A. Product Data: Submit manufacturer's specifications on manufactured products and factory-fabricated ductwork, used for work of this section.

1.04 DELIVERY, STORAGE, AND HANDLING:

A. Protect shop-fabricated and factory-fabricated ductwork, accessories and purchased products from damage during shipping, storage and handling. Prevent end damage and prevent dirt and moisture from entering ducts and fittings.

B. Where possible, store ductwork inside and protect from weather. Where necessary to store outside, store above grade and enclose with waterproof wrapping.

PART 2 - PRODUCTS

A. Exposed Ductwork Materials: Where ductwork is indicated to be exposed to view in occupied spaces, provide materials which are free from visual imperfections including pitting, seam marks, roller marks, oil canning, stains and discolorations, and other imperfections, including those which would impair painting.

B. Sheet Metal: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel complying with ANSI/ASTM A 527, lock-forming quality, with ANSI/ASTM A 525, G90 zinc coating; mill phosphatized for exposed locations.

2.01 MISCELLANEOUS MATERIALS:

A. General: Provide miscellaneous materials and products of types and sizes indicated on the Delivery order, provide type and size required to comply with ductwork system requirements including proper connection of ductwork and equipment.

B. Air Terminals: Ceiling supply diffuser shall be commercial type (residential type is not acceptable) of the square 4-way throw type and constructed of steel or aluminum with all exposed edges rolled or otherwise stiffened and rounded. Exposed factory finish shall be as selected by the Contracting Officer. Interior parts shall be flat black or dark gray. Diffuser shall be furnished with a factory fabricated opposed-blade gang-operated (with removable key) volume damper. The design shall be such that the air distribution pattern and noise generation are not affected when the damper is closed to absorb excess pressure up to 1/4 inch w.g. Ceiling diffuser shall be sized in accordance with the recommendations of the manufacturer and NC noise level shall not exceed 35 at delivery rate.

C. Ceiling return grilles shall be grid core type. Factory finish shall be as selected by the Contracting Officer. Grilles shall have aluminum frames and 1/2 x 1/2 x 1/2 grid core, furnished without volume control and shall be suitable for lay-in inverted T-bar installation. Grid core shall be either metal or type material that is non-flammable and non-toxic when exposed to heat.

2.02 FABRICATION:

A. Shop fabricate ductwork in 4, 8, 10 or 12-foot lengths, unless otherwise indicated or required to complete runs. Pre-assemble work in shop to greatest extent possible, so as to minimize field assembly of systems. Disassemble systems only to extent necessary for shipping and handling. Match-mark sections for reassembly and coordinated installation.

B. Shop fabricate ductwork of gages and reinforcement complying with SMACNA "Low Pressure Duct Standards - 5th Edition".

C. Shop fabricate ductwork of gauges and reinforcement complying with ASHRAE Handbook and Product Directory, most current edition of the Equipment Volume, Chapter 1, "Duct Construction".

D. Fabricate duct fittings to match adjoining ducts, and to comply with duct requirements as applicable to fittings. Except as otherwise indicated, fabricate elbows with center-line radius equal to associated duct width; and fabricate to include turning vanes in elbows where shorter radius is necessary. Limit angular tapers to 30°F for contracting tapers and 20°F for expanding tapers.

E. Fabricate ductwork with accessories installed during fabrication to the greatest extent possible.

F. Fabricate ductwork with duct liner in each section of duct where indicated. Laminate liner to internal surfaces of duct in accordance with instructions by manufacturers of lining and adhesive, and fasten with mechanical fasteners.

G. Flexible insulated duct including connectors shall be U.L. listed. The uninsulated air duct proper of the flexible duct shall be of metal or non-collapsible coated mineral base fabric type. Fabric shall be helically supported by steel wire permanently connected, or flat steel strips mechanically interlocked, to the fabric. Supports shall be zinc or plastic coated unless completely encased in the fabric. Insulation shall be sheathed with a glass net reinforced vapor barrier. Working pressure rating for insulated flexible duct shall be 1-1/2" of water, at a temperature of 0 to 25°F.

2.03 FACTORY-FABRICATED DUCTWORK:

A. General: At installer's option, provide factory-fabricated duct and fittings, in lieu of shop-fabricated duct and fittings.

B. Material: Galvanized sheet steel complying with ANSI/ASTM A 527, lock-forming quality, with ANSI/ASTM A525, G90 zinc coating, mill phosphatized.

C. Gauge: 28 ga. minimum for round and oval ducts and fittings, 4" through 24" diameter.

D. Elbows: One piece construction for 90 deg. and 45 deg. elbows 14" and smaller. Provide multiple core construction for larger diameters with standing seam circumferential joint.

E. Divided Flow Fittings: 90 deg. tees, constructed with saddle tap spot weld and bonded to duct fitting body.

PART 3 - EXECUTION

3.01 INSTALLATION OF DUCTWORK:

A. General: Assemble and install ductwork in accordance with recognized industry practices which will achieve air tight (5% leakage) and noiseless (no objectional noise) systems, capable of performing each indicated service. Install each run with minimum of joints. Align ductwork accurately at connections, within 1/8" misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers and anchors of type which will hold ducts true-to-shape and to prevent buckling.

B. Seal ductwork, after installation, to seal class recommended, and method prescribed in SMACNA "Low Pressure Duct Standards - 5th Edition".

C. Complete fabrication of work at project as necessary to match shop-fabricated work and accommodate installation requirements.

D. Coordinate duct installations with installation of accessories, dampers, coil frames, equipment, controls and other associated work of ductwork system.

E. Support ductwork in manner complying with SMACNA "Low Pressure Duct Standards - 5th Edition" hangers and supports section.

3.03 CLEANING AND PROTECTION:

A. Clean ductwork internally, unit-by-unit as it is installed, of dust and debris. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration.

B. Strip protective paper from stainless ductwork surfaces, and repair finish wherever it has been damaged.

C. Temporary Closure: At ends of ducts which are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering which will prevent entrance of dust and debris until time connections are to be completed.

END OF SECTION 15720

SECTION 15760 - TESTING, ADJUSTING AND BALANCING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK;

A. Extent of testing, adjusting and balancing work required by this section is indicated on drawings and schedules, and by requirements of this section, and is defined to include, but is not necessarily limited to air distribution systems, hydronic distribution systems and associated equipment and apparatus of mechanical work. The work consists of setting speed and volume (flow) adjusting facilities provided for systems/ recording data, conducting tests, preparing and submitting reports, and recommending modifications to work as required by contract documents.

B. Component types of testing, adjusting and balancing specified in this section includes the following as applied to mechanical equipment:

1. Existing air-conditioning units.

2. Ductwork systems.

C. Refer to Division-15 sections for pressure testing of piping; not work of this section.

1.01 QUALITY ASSURANCE:

A. Tester's Qualifications: A specialist certified by National Environmental Balancing Bureau (NEBB) in those testing and balancing disciplines similar to those required for this project and who is also original Installer of system to be tested.

B. Tester's Qualifications: A firm certified by National Environmental Balancing Bureau (NEBB) in those testing and balancing disciplines similar to those required for this project, who is not Installer of system to be tested and is otherwise independent of project.

C. Codes and Standards:

1. NEBB Compliance: Comply with NEBB's "Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems" as applicable to mechanical air and hydronic distribution systems, and associated equipment and apparatus.

2. Industry Standards: Comply with ASHRAE recommendations pertaining to measurements, instruments and testing, adjusting and balancing, except as otherwise indicated.

1.03 SUBMITTALS:

A. Submit certified test reports, signed by Test and Balance Supervisor who performed TAB work. In addition, have report certified by Professional Engineer who is familiar with TAB work, this project, and is registered in jurisdiction where testing is being conducted.

1. Include identification and types of instruments used, and their most recent calibration date with submission of final test report.

B. The Contractor shall maintain a copy of either NEBB or AABC standards on the site during all TAB work. Said document(s) shall be made available to Government representatives for reference as to minimum requirements.

C. The Contractor shall maintain a copy of either NEBB standards on the site during all TAB work. Said document(s) shall be made available to government representatives for reference as to minimum requirements.

D. Maintenance Data: Include in maintenance manuals, copies of certified test reports, identification of instruments, and data on Engineer; in accordance with requirements of Division 1.

1.04 JOB CONDITIONS:

A. Do not proceed with testing, adjusting, and balancing work until work has been completed and is operable. Ensure that there is no latent residual work still to be completed on the tested equipment.

B. Do not proceed until work scheduled for testing, adjusting and balancing is clean and free from debris, dirt and discarded building materials.

PART 2 - PRODUCTS

2.01 PATCHING MATERIALS:

A. Except as otherwise indicated, use same products as used by original Installer for patching holes in insulation, ductwork and housings which have been cut or drilled for test purposes, including access for test instruments, attaching jigs and similar purposes.

1. At Tester's - option, plastic plugs with retainers may be used to patch drilled holes in ductwork and housings.

2.02 TEST INSTRUMENTS:

A. Utilize test instruments and equipment for TAB work required, of type, precision and capacity as recommended in the following TAB standards:

1. NEBB's Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems.

2. Wherever permanently installed measuring equipment is provided, such as air volume monitors, BTU meters, flow meters, temperature and pressure gauges, etc., these shall be used in addition to TAB instrumentation. Any discrepancies in accuracy shall be brought to the attention of the government. Where permanently installed instrumentation meets accuracy requirements for TAB work, they may be used provided TAB Contractor can verify calibration of installed instruments.

B. The Contractor shall employ manufactured enclosure type cones, capable of air volume direct readings, for all diffuser air flow measurements.

PART 3 - EXECUTION

3.01 FIELD WORK:

A. Examine installed work and conditions under which testing is to be done to ensure that work has been completed, cleaned and is operable. Do not proceed with TAB work until unsatisfactory conditions have been corrected in manner acceptable to Tester.

B. Test, adjust and balance environmental systems and components, as indicated, in accordance with procedures outline in applicable standards.

C. Patch holes in insulation, which have been cut for test purposed, in manner recommended by original Installer.

3.02 REPORTS:

A. Prepare report of test results, including instrumentation of calibration reports, in format recommended by applicable standards.

B. Prepare report of recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced; including, where necessary, modifications which exceed requirements of contract documents for mechanical work.

3.03 FINAL TESTS, INSPECTION AND ACCEPTANCE:

A. At time of final inspection, Contractor shall re-check, in presence of Government Representative, random selections of data (water and air quantities, air motion and sound levels) recorded in Certified Report.

1. Points and areas for re-check shall be selected by Government Representative.

2. Measurement and test procedures shall be same as approved for work forming basis of Certified Report.

3. Selection for re-check (specific plus random), in general, will not exceed 25 percent of total number tabulated in report, except that special air systems may require a complete re-check for safety reasons.

B. Re-tests: If random tests elicit a measured flow deviation of 10 percent or more from, or a second level of 2 db or more greater than, that recorded in Certified Report listings, at 10 percent or more of the re-checked selections, report is rejected, systems shall be readjusted and tested, new data recorded, new Certified Reports submitted, and new inspection tests made, at no additional cost to Government. Retainage time referred to in paragraph 3.5 of this section shall be based on data of final acceptance of Certified report.

C. Marking of Settings: Following final acceptance of Certified Reports by Government, settings of valves, splitters, dampers and other adjustment devices shall be permanently marked by the Contractor so that adjustment can be restored if disturbed at any time. Devices shall not be marked until after final acceptance.

END OF SECTION 15760

SECTION 16020 – RACEWAYS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Extent of raceways is indicated on Delivery Order.

B. Types of raceways in this section include the following:

1. Flexible metal conduit.

2. Surface metal raceways.

3. Underfloor metal raceways.

1.02 QUALITY ASSURANCE:

A. Manufacturers: Firms regularly engaged in manufacture of raceway systems of types and sizes required, whose products have been in satisfactory use in similar service for not less than 3 years.

B. Contractor: Qualified with at least 3 years of successful installation experience on projects with electrical raceway work similar to that required for this project.

C. NEMA Compliance: Comply with applicable requirements of NEMA standards pertaining to raceways.

D. UL Compliance and Labeling: Comply with provisions of UL safety standards pertaining to electrical raceway systems; and provide products and components which have been UL-listed and labeled.

E. NEC Compliance: Comply with requirements as applicable to construction and installation of raceway systems.

1.03 SUBMITTALS:

A. Product Data: Submit manufacturer's data including specifications, installation instructions and general recommendations, for each type of raceway required. Include data substantiating that materials comply with requirements for the following:

1. Underfloor metal raceway systems.

PART 2 - PRODUCTS

2.01 METAL CONDUIT AND TUBING:

A. General: Provide metal conduit, tubing and fittings of types, grades, sizes and weights (wall thicknesses) for each service indicated on the Delivery Order. Where types and grades are not indicated, provide proper selection determined by the Contractor to fulfill wiring requirements, and comply with applicable portions of NBC for raceways.

B. Rigid Steel Conduit: FS WW-C-0581 and ANSI C8O.1

C. Electrical Metallic Tubing (EMT): FS WW-C-563 and ANSI C80.3.

D. EMT Fittings: FS W-F-408.

1. Use Type 1 fittings for rain-tight connections.

2. Use Type 2 fittings for concrete-tight connections.

3. Use Type 3 fittings for other miscellaneous connections.

E. Flexible Metal Conduit: FS WW-C-566, of the following type:

1. Type 1: Aluminum.

2. Type 2: Zinc-coated steel.

F. Flexible Metal Conduit Fittings: FS W-F-406, Type 1, Class 1, and Style A.

2.02 WIRE-WAYS:

A. General: Provide electrical raceways of types, grades, sizes, weights (wall thicknesses), number of channels, for each type service indicated on the Delivery Order. Provide complete assembly of raceway including, but not necessarily limited to, couplings, offsets, elbows, expansion joints, adapters, holddown straps, end caps, and other components and accessories as needed for complete system.

Where types and grades are not indicated, provide proper selection as determined by the Contractor to fulfill wiring requirements, and comply with applicable provisions of NEC for electrical raceways.

B. Surface Metal Raceways: Provide surface metal raceways of sizes and channels indicated; in compliance with FS W-C-582; construct of galvanized steel with snap-on covers, with 1/8" mounting screw knockouts in base approximately 8" o.c. Provide fittings indicated which match and mate with raceway. Finish with manufacturer's standard prime coating suitable for painting. Provide raceways of following types:

1. Type 1: For wall and ceiling installations.

2. Type 2: For floor installation.

3. Type 3: For wall and ceiling installations; raceway constructed with integral receptacles.

C. Single-Level Underfloor Duct Systems: Provide single-level, two channel underfloor duct systems of types, and sizes indicated; one channel for electrical service and one for telephone service having 2" NPT inserts on 24" centers. Provide junction boxes, couplings, supports, adapters and other components to form a complete assembly. Construct ducts and junction boxes of 14-gauge steel and coat with corrosion-resistant finish. Design junction box cover plates with upward adjustment of 3/8" capable of leveling flush with finished concrete floor, before and after concrete has hardened. Provide duct insert markers for identifying electrical and telephone channels.

PART 3 - EXECUTION

3.01 INSTALLATION OF ELECTRICAL RACEWAYS:

A. Install electrical raceways where indicated on the Delivery Order; in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA "Standard of Installation", and complying with recognized industry practices.

B. Coordinate with other work including metal and concrete deck work, as necessary to interface installation of electrical raceways and components with other work.

1. Coat underfloor metal raceways with bitumastic type protective coating prior to placing concrete.

2. Level and square raceway runs, and install at proper elevations/heights.

3. Complete installation of electrical raceways before starting installation of cables/wires within raceways.

4. Install flexible conduit for motor connections, and for other electrical equipment connections where subject to movement and vibration.

END OF SECTION 16020

SECTION 16050 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 WORK INCLUDES:

A. Work covered by this Specification shall include furnishing all labor, materials, equipment, and services required to construct and install the complete electrical system shown on accompanying Drawings and specified herein.

B. This work shall include the general layout of the complete electrical system; circuits, controls, fire alarm system extension, and other work. No rough-in or connection, etc., for mechanical equipment shall be done until coordination is completed with Mechanical Contractor.

1.2 RELATED WORK:

A. Specified Elsewhere:

1. 16020 – Raceways
2. 16121 – Control/Signal Transmission Media
4. 16135 - Pull and Junction Boxes
5. 16143 - Wire Connections and Connecting Devices
6. 16470 – Panel Boards
7. 16510 - Lighting

1.3 SYSTEM DESCRIPTION:

A. See individual sections.

1.4 QUALITY ASSURANCE:

A. Codes and Standards:

1. Permits:
   a. City electric permit (where applicable)

2. Building Codes (Latest Edition Currently Enforced):
   a. OSHA
   b. BOCA
   c. NEC
   d. NFPA
   e. ANSI - A117.1 - Accessibility Standard

3. Tests by independent agencies whose classifications and requirements have general acceptance as regulatory:
   a. UL
   b. JIC
   c. ANSI
   d. NEMA
   e. FM
   f. IEEE

1.5 SUBMITTALS:

A. See individual sections. Submit ten copies of each required product data submittal. The Architect will retain three copies and will return the other marked with the action taken and corrections or modifications required.

1. Unless the Architect observes noncompliance with provisions of the contract Documents, the

submittal may serve as the final submittal.

B. Shop Drawings: Shop drawings are original drawings prepared by Contractor, subcontractor, supplier, or distributor which illustrate some portion of the work showing fabrication, layout, setting, or erection details.

1. Prepared by qualified detailer.
2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.
3. Minimum Sheet Size: 18" x 24" (46 cm x 61 cm).
3. Reproductions for Submittals: One reproducible sepia and two blueline copies.
4. The Contractor shall prepare the shop drawing and sample record schedule form and submit for review prior to issuance of shop drawings.

C. Product Data:

1. Manufacturer's Standard Schematic Drawings:
   a. Modify to delete information which is not applicable to Project.
   b. Supplement standard information to provide additional information applicable to Project.

2. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data.
   a. Clearly mark each copy to identify pertinent materials, products, or models.
   b. Show dimensions and clearances required.
   c. Show performance characteristics and capacities.
   d. Show wiring diagrams and controls.

3. Submit sufficient quantity of product data for Contractor's distribution plus 3 copies to be retained by the Architect/Engineer; total copies not to exceed 10.

D. Samples: Physical samples to illustrate materials, equipment, or workmanship. Approved samples establish standard by which complete work is judged.

1. Office Samples: Of sufficient size to clearly illustrate:
   a. Functional characteristics of product or material with integrally related parts and attachment devices.
   b. Full range of color samples.

E. Specified Products List:

1. Within 30 business days after date of Notice of Award, submit to the Architect/Engineer six copies of complete list of all products which are proposed for installation.

2. Tabulate list of each Specification Section.

3. For products specified under reference standards, include with listing of each product:
   a. Name and address of manufacturer
   b. Trade name
   c. Model or catalog description
   d. Manufacturer's Data:
      1) Performance and test data
      2) Reference standards

F. Submittal Requirements:

1. Accompany submittals with transmittal letter, in duplicate, containing:
   a. Date
   b. Project title and number
   c. Contractor's name and address
   d. The number of shop drawings, product data, and samples submitted
   e. Notification of deviations from Contract
   f. Other pertinent data

2. Submittals shall include:
   a. Date and revision dates
   b. Project title and number
   c. Names of:
      1) Architect/Engineer
      2) Architect/Engineer's Consultant
      3) Subcontractor
      4) Sub-subcontractor
      5) Supplier
      6) Manufacturer

   d. Identification of product or material
   e. Field dimensions, clearly identified as such
   f. Specification Section and page numbers
   g. A blank space, 4" x 4" (10 cm x 10 cm) for Architect/Engineer's stamp
   h. Identification of previously approved deviation(s) from Contract Documents
   i. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements, and compliance with Contract
   j. Space for General Contractor's approval stamp

G. Resubmission Requirements:

1. Shop Drawings:
   a. Revise initial drawings as required and resubmit in accordance with submittal procedures.
   b. Indicate on drawings all changes which have been made in addition to those requested by Architect/Engineer.

2. Product Data and Samples: Submit new datum and samples as required for initial submittal.
3. Make all resubmittals within 15 business days after date of Architect/Engineer's previous review.

H. Samples:

1. Samples shall be submitted for all items calling for samples elsewhere in this Specification and for all product substitutions.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. See individual sections.

B. Material shall be stored in a dry location off walkways and other locations where damage may occur.

1.7 PROJECT CONDITIONS:

A. Existing Conditions:

1. If existing conditions prohibit proper installation or installation as shown on the Drawings, Contractor shall contact the Architect/Engineer for a solution.

B. Protection:

1. Electrical Contractor shall protect all electrical items scheduled to remain and shall replace items which are damaged during construction.

C. Sequencing, Scheduling:

1. Installation of electrical equipment shall be coordinated with other Contractors.

1.8 WARRANTY:

A. Electrical Contractor's Warranty:

1. Time period one year unless otherwise noted.

B. Manufacturer's Warranty:

1. Time period one year unless otherwise noted.

PART 2 - PRODUCTS

2.1 MATERIALS (ACCEPTABLE PRODUCTS):

A. Anchors (Low-velocity, Powder-actuated):

1. Diamond
2. Ramset
3. Star

B. Masonry Anchors:

1.	Rawl	Rawl-stud, Lok-bolt, Saber-tooth
2.	Redhead	Type S, Type F, Type HN
3.	Arro	Type 800, Type 500, Type 30000
4.	Diamond	Sup-R-Sleeve, Blue-Cut

C. Hollow Wall Anchors:

1.	Rawl	Toggle-bolt
2.	Redhead	Type TR
3.	Arro	Type 8000, Type 7500
4.	Diamond	70000 Series

D. Plastic Anchors:

1.	Rawl	Bantam Plug
2.	Redhead	Type FP, Type PS
3.	Arro	Type 5400 Series
4.	Diamond	08000

E. See individual sections.

2.2 FABRICATION AND MANUFACTURER:

A. See individual sections.

B. Anchors:

1. Have sufficient holding power for intended use.

2. Powder-actuated, steel-expansion, or steel toggle-bolt type.

3. Plastic anchors may be used only for 3/4" (19 mm) and 1" (25 mm) conduit straps on horizontal runs on vertical surfaces, 8' (2.5 meters) higher above floor, landing, or platforms.

PART 3 EXECUTION

3.1 INSTALLATION/APPLICATION/PERFORMANCE/ERECTION:

A. Listed or Labeled Equipment:

1. Listed or labeled equipment shall be installed in accordance with instructions included in the listing or labeling.

2. Every precaution has been taken to insure Drawings and Specifications do comply with these instructions. If the Electrical Contractor feels some item or items may not comply with these instructions, notify the Architect/Engineer for a solution.

B. Anchors:

1. Electrical equipment shall be firmly attached to the structure using anchors, screws, and hangers UL-listed for the use intended. The use of tie wire, metal strapping, and other non-UL-listed equipment for electrical use shall not be permitted.

2. Anchors used in structural steel shall have location and type approved by the Architect/Engineer prior to installation (to prevent structural damage from occurring).

C. All expenses carried by the Architect/Engineer in troubleshooting systems' problems caused by inadequate workmanship or other form of poor performance on the part of a Contractor shall be borne by that Contractor.

D. Prior to equipment installation, location of any outlet, fixture, etc., may be changed by the Owner's Representative as much as 10'-0" (3 meters) without additional cost to the Owner.

3.2 FIELD QUALITY CONTROL:

See individual sections.

3.3 ADJUST AND CLEAN:

A. See individual sections.

B. Protection of Complete Work:

1. Electrical Contractor shall protect completed work and repair or replace damage that occurs.

2. Equipment installed prior to painting of room shall be protected against paint damage.

C. Electrical material shall be clean, inside and out, prior to acceptance of work by Owner.

END 16050

SECTION 16121 - CONTROL/SIGNAL TRANSMISSION MEDIA

PART 1 – GENERAL

1.1 General:

A. This Section includes cables designed and used for electrical transmission in control, data, and signal circuits.

B. UL Compliance: Comply with applicable requirements of UL Standard 910 "Test Method for Fire and Smoke Characteristics of Cables Used in Air Handling Spaces." Provide products that are UL-listed and labeled for such use.

C. NEMA/ICEA Compliance: Comply with NEMA/ICEA Standard WC 41, "Coaxial Communication Cable."

D. Electronic Industries Association Compliance: Comply with EIA Standards EIA-230, "Color Marking of Thermoplastic Wire" and EIA-258, "Semi-Flexible Air Dielectric Coaxial Cables and Connectors, 50 Ohms."

E. MIL-SPEC Compliance: Comply with MIL-C-3093, "Telephone Cable; Inside Distribution Wiring," MIL-C-55021, "Twisted-Pair and Triplet Cables; Hookups General Specifications," MIL-C17/28, "Radio Frequency Flexible Coaxial Cables, 50 ohms," and MIL-C-17/29, "Radio Frequency Flexible Coaxial Cables, 75 Ohms."

PART 2 - PRODUCTS

2.1 Products:

A. General: Provide control/signal transmission media of manufacturer's standard materials as indicated by published product information, designed and constructed as recommended by manufacturer, for a complete installation and for applications indicated. See schedule at end of this section.

B. Coaxial: Provide the following types:

1. RG-59/U: Coaxial single conductor, 75-ohm characteristic impedance, with polyethylene low-density dielectric core, constructed in compliance with MIL-C-17/29, and 100 percent sweep tested 5-300 MHz.

PART 3 - EXECUTION

3.1 Installation:

A. General: Install control/signal transmission media in accordance with manufacturer's written instructions and in compliance with NEC.

B. Coordinate installation of transmission media with other Work.

C. Install transmission media without damaging conductors, shield, or jacket. Do not either in handling or installation bend cable to smaller radii than minimum recommended by

manufacturer. Ensure that medium manufacturer's recommended pulling tensions are not exceeded. Pull conductors simultaneously where more than one is being installed in same raceway. Use pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Use pulling means, including fish tape, cable, rope, and basket weave wire/cable grips that will not damage media or raceway.

D. Install exposed cable, parallel and perpendicular to surfaces or exposed structural members, and follow surface contours where possible.

E. No splices are allowed except at indicated splice points.

F. Use splice and tap connectors that are compatible with media material.

G. Tighten connectors and terminals, including screws and bolts, in accordance with manufacturer's published instructions or torque tightening values.

H. Prior to usage, test control/signal transmission media for electrical continuity and for short circuits. In addition, test the cable installation with a time domain reflectometer with strip chart recording capability and anomaly resolution to within one foot in runs up to 1,000 feet in length. Test all cable segments for faulty connectors, splices, terminations, and the integrity of the cable and its component parts. Replace malfunctioning transmission media with new materials, then retest until satisfactory performance is achieved.

END OF SECTION 16121

SECTION 16135 - ELECTRICAL BOXES AND FITTINGS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Extent of electrical box and electrical fitting work is indicated on Delivery order.

B. Types of electrical boxes and fittings specified in this section include the following:

1. Outlet boxes.

2. Junction boxes.

3. Pull boxes.

4. Floor boxes.

1.02 QUALITY ASSURANCE:

A. Manufacturers: Firms regularly engaged in manufacture of electrical boxes and fittings, of types, sizes, and capacities required, whose products have been in satisfactory use in similar service for not less than 3 years.

B. Installer's Qualifications: Qualified with at least 3 years of successful installation experience on projects with electrical installation work similar to that required for project.

C. NEC Compliance: Comply with NEC as applicable to construction and installation of electrical wiring boxes and fittings.

D. UL Compliance: Comply with applicable requirements of UL 50 "Electrical Cabinets and Boxes", UL-467 Electrical Grounding Bonding Equipment, UL 514A "Electrical Metallic Outlet Boxes", UL 514B "Fittings for Conduit and Outlet Boxes", UL 514C "Nonmetallic Outlet Boxes, Flush-Device Boxes and Covers", and UL 886 "Electrical Outlet Boxes and Fittings for Use in Hazardous Locations, Class I, Groups A, B, C, and D, and Class II, Groups, E, F, and G", pertaining to electrical boxes and fittings. Provide electrical boxes and fittings which are UL-listed and labeled.

1.03 SUBMITTALS:

A. Product Data: Submit manufacturer's data on electrical boxes and fittings.

PART 2 - PRODUCTS

2.01 FABRICATED MATERIALS:

A. Outlet Boxes: Provide galvanized coated flat rolled sheet steel outlet wiring boxes, of shapes, cubic inch capacities, and sizes, including box depths as indicated, suitable for installation at respective locations. Construct outlet boxes with mounting holes, and with cable and

conduit-size knockout openings in bottom and sides. Provide boxes with threaded screw holes, with corrosion resistant cover and grounding screws for fastening surface and device type box covers, and for equipment type grounding.

1. Provide 4" X 4" x 1-1/2" boxes for switches, unless otherwise specified on the Delivery Order.

2. Provide 4" X 2-1/8" X 2-1/8" boxes for receptacles, unless otherwise specified on the Delivery Order.

B. Outlet Box Accessories: Provide outlet box accessories as required for each installation, including box supports, mounting ears and brackets, wallboard hangers, box extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes, which are compatible with outlet boxes being used to fulfill installation requirements for individual wiring situations. Choice of accessories is Installer's code compliance option, subject to Contracting Officer's approval.

C. Device Boxes: Provide galvanized coated flat rolled sheet-steel non-gangedable device boxes, of shapes, cubic inch capacities, and sizes, including box depths as indicated, suitable for installation at respective locations. Construct device boxes for flush mounting with mounting holes, and with cable-size knockout openings in bottom and ends, and with threaded screw holes in end plates for fastening devices. Provide cable clamps and corrosion-resistant screws for fastening cable clamps, and for equipment type grounding.

1. Device Box Accessories: Provide device box accessories as required for each installation, including mounting brackets, device box extensions, switch box supports, plaster ears, and plaster board expandable grip fasteners, which are compatible with device boxes being utilized to fulfill installation requirements for individual wiring situations. Choice of accessories is Installer's code-compliance option, subject to Contracting Officer's approval.

D. Junction and Pull Boxes: Provide galvanized code-gauge sheet steel junction and pull boxes, with screw-on covers; of types, shapes and sizes, to suit each respective location and installation; with welded seams and equipped with steel nuts, bolts, screws and washers.

E. Floor Boxes: Provide cast-iron rain-tight adjustable floor boxes as indicated, with threaded-conduit-entrance ends, and vertical adjusting rings, gaskets, brass floor plates with flush screw-on covers with ground flange and stainless steel cover screws.

1. Floor Box Accessories: Provide flush type two-pole, three-wire, grounded-pole 125-volts, 20-amperes, floor-type receptacles with flanges.

F. Bushings, Knockout Closures and Locknuts: Provide corrosion resistant box knockout closures, conduit locknuts and malleable iron conduit bushings, offset connectors, of types and sizes to suit respective installation requirements and applications.

PART 3 - EXECUTION

3.01 INSTALLATION OF ELECTRICAL BOXES AND FITTINGS:

A. General: Install electrical boxes and fittings as indicated on Delivery Order, in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA's 'Standard of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.

B. Coordinate installation of electrical boxes and fittings with wire/cable, wiring devices, and raceway installation work.

C. Provide knockout closures to cap unused knockout holes where blanks have been removed.

D. Install electrical boxes in those locations to ensure accessibility to enclosed electrical wiring.

E. Avoid installing boxes back-to-back in walls. Provide not less than 6" (150 mm) separation.

F. Avoid installing aluminum products in concrete.

G. Position recessed outlet boxes accurately to allow for surface finish thickness.

H. Set floor boxes level and flush with finish flooring material.

I. Avoid using round boxes where conduit mutt enter box through side of box, which would result in difficult and insecure connections when fastened with locknut or bushing on rounded surfaces.

J. Fasten electrical boxes firmly and rigidly to substrate, or structural surfaces to which attached, or solidly embed electrical boxes in concrete or masonry.

K. Provide electrical connections for installed boxes.

L. Subsequent to installation of boxes, protect boxes from construction debris and damage.

M. Identification for all junctions, outlets or pullboxes. Label or mark coverplates indicating system served such as "SIG" for signal, "TEL" for telephone or PNL-A 2, 4, 6 for panel designation and branch circuits 2, 4, 6.

3.02 GROUNDING:

A. Upon completion of installation work, properly ground electrical boxes and demonstrate compliance with requirements.

END OF SECTION 16135

SECTION 16143 - WIRING DEVICES

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Extent of wiring device work is indicated on the Delivery Order Wiring devices are defined as single discrete units of electrical distribution systems which are intended to carry but not utilize electric energy.

B. Types of electrical wiring devices in this section include the following:

1. Receptacles.
2. Switches.
3. Wallplates.
4. Floor service outlets.

1.02 QUALITY ASSURANCE:

A. Manufacturers: Firms regularly engaged in manufacture of electrical wiring devices, of types, sizes, and rating required, whose products have been in satisfactory use in similar service for not less than 3 years.

B. Installer's Qualifications: Qualified with at least 2 years of successful installation experience on projects with electrical installation work similar to that required for project.

C. NEC Compliance: Comply with NEC as applicable to construction and installation of electrical wiring devices.

D. UL Compliance: Comply with applicable requirements of UL 5, 20, 231, 467, 486A, 498, 943, and 1054 pertaining to installation of wiring devices. Provide wiring devices which are UL-listed and labeled.

E. IEEE Compliance: Comply with applicable requirements of IEEE Std 241, "Recommended Practice for Electric Power Systems in Commercial Buildings", pertaining to electrical wiring systems.

F. NEMA Compliance: Comply with applicable portions of NEMA Std Pub/No. WD 1, "General Purpose Wiring Devices", WD 2, "Semiconductor Dimmers for Incandescent Lamps", and WD 5, "Specific-Purpose Wiring Devices".

G. FS Compliance: Comply with FS W-C-582, FS W-C-596 (Series), FS WP 455A(6), and FS W-S-896 (Series) pertaining to electrical power connectors, toggle switches, and wallplates.

H. ANSI Compliance: Comply with C73 (Series) pertaining to plugs and receptacle devices.

1.03 SUBMITTALS:

A. Product Data: Submit manufacturer's data on electrical wiring devices.

B. Certification: Two weeks prior to final inspection, deliver to Contracting Officer four copies of following:

1. Certification by Contractor that devices used comply with drawings and specifications and have been properly installed, aligned, and tested.

PART 2 - PRODUCTS

2.01 FABRICATED WIRING DEVICES:

A. General: Provide factory-fabricated wiring devices, in types, colors, and electrical ratings for applications indicated and which comply with NEMA Stds Pub/No. WD 1. Provide brown color devices and wallplates except as otherwise indicated; color selection to be verified by Contractor with the Contracting Officer.

B. Receptacles:

1. General-Duty Duplex: Provide duplex general-duty type receptacles, 2-pole, 3-wire grounding, with green hexagonal equipment ground screw, ground terminals and poles internally connected to mounting yoke, 15-amperes, 125-volts, with metal plaster ears, design for side wiring with four captively held binding screws and provisions for back wiring from eight separate metal wiring clamps, with spring loaded, screw activated pressure plate, with NEMA configuration 5-15R unless otherwise indicated.

2. Duplex snap: Provide general-duty duplex flush 3way AC quiet switches, 20-amperes, 120-277 volts, with mounting yoke insulated from mechanism, equip with plaster ears, switch handles, side-wired screw terminals, with break-off tab features, which permits wiring for separate or common feed.

3. Three Way: Provide general-duty flush 3-way AC quiet switches, 20-amperes, 120-277 volts, with mounting yoke insulated from mechanism, equip with plaster ears, lock type switch handles, side-wired screw terminals, with break-off tab features, which allows wiring with separate or common feed.

4. Four Way: Provide general-duty flush 4-way AC quiet switches, 20-amperes, 120-277 volts, with mounting yoke insulated from mechanism, equip with plaster ears, switch handles, side wired screw terminals, with break-off tab features, which allows wiring with separate or common feed.

2.02 WIRING DEVICE ACCESSORIES:

A. Wallplates: Provide wallplates for single and combination wiring devices, of type, sizes, and with ganging and cutouts as indicated. Select plates which mate and match wiring devices to which attached. Construct with metal screws for securing plates to devices; screw heads colored to match finish of plates; wallplates colored to match wiring devices. Provide wall plates possessing the following additional construction features:

1. Material and Finish: Steel plate with wrinkled finish, baked-on white insulating enamel.

B. Floor Service Outlets: Provide floor service receptacle outlets and fittings of types and ratings indicated. Construct of die cast aluminum, satin finish with 20-amperes, 125-volts,

back-to-back gray duplex receptacles NEMA type 5-20R. Provide with 1" NPT, 1" long, locking nipple for installation.

C. Poke-Through Assembly Devices: Provide factory-assembled pokethrough assembly devices, with power-rated 15-amperes, 125-volts, single pole, 3-wire, grounding, duplex NEMA type 5-15R receptacles; capable of maintaining fire floor rating of 3-hours. Construct for installation in concrete floor 3" thick, with center tube, fire-stop wafers, spreader plate, service fitting base plate, and 4 11/16" conduit box. Provide floor service fitting base with alignment adjustment screws.

D. Plugs: Furnish matching plug for all receptacles except convenience NEMA 5-15 and 5-20 for connection of equipment.

PART 3 - EXECUTION

3.01 INSTALLATION OF WIRING DEVICES:

A. Install wiring devices as indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in accordance with recognized industry practices to fulfill project requirements. Where not indicated, mount switch adjacent latch jamb of door.

B. Coordinate with other work, including painting, electrical boxes and wiring work, as necessary to interface installation of wiring devices with other work.

C. Install wiring devices only in electrical boxes which are clean; free from excess building materials, dirt, and debris.

D. Install galvanized steel wall plates in unfinished spaces.

E. Install wiring devices after wiring work is completed.

F. Install wallplates after painting work is completed.

G. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for wiring devices. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Stds 486 A and B. Use properly scaled torque indicating hand tool.

3.02 PROTECTION OF WALL PLATES AND RECEPTACLES:

A. Upon installation of wall plates and receptacles, advise Contractor regarding proper and cautious use of convenience outlets. At time of Substantial Completion, replace those items which have been damaged, including those burned and scored by faulty plugs.

3.03 GROUNDING:

A. Provide equipment grounding connections for wiring devices, unless otherwise indicated. Tighten connections to comply with tightening torques specified in UL Std 486A to assure permanent and effective grounds.

3.04 TESTING:

A. Prior to energizing circuitry, test wiring devices for electrical continuity, and for short-circuits. Ensure proper polarity of connections is maintained. Subsequent to energization, test wiring devices to demonstrate compliance with requirements.

END OF SECTION 16143

SECTION 16470 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Requirements of the following Division 16 Sections apply to this Section:

1. "Basic Electrical Requirements."
2. "Basic Electrical Materials and Methods."

1.2 SUMMARY

A. This Section includes lighting and power panelboards and associated auxiliary equipment rated 600 V or less.

B. Related Sections: The following Division 16 Sections contain requirements that relate to this Section:

1. "Overcurrent Protective Devices" for circuit breakers, fusible switches, fuses, and other devices used in panelboards.
2. "Motor Controllers" for combination starters installed in panelboards.

1.3 DEFINITIONS

A. Load Center: A panelboard with thermal magnetic circuit-breaker branches, primarily of the plug-in type, designed for residential and light commercial projects, operating at 240 V and below, available in both single and 3-phase versions, and equipped with combination flush/surface mounting trim.

B. Overcurrent Protective Device (OCPD): A device operative on excessive current that causes and maintains the interruption of power in the circuit it protects.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data for each type panelboard, accessory item, and component specified.

C. Shop drawings from manufacturers of panelboards including dimensioned plans, sections, and elevations. Show tabulations of installed devices, major features, and voltage rating. Include the following:

1. Enclosure type with details for types other than NEMA Type 1.
2. Bus configuration and current ratings.
3. Short-circuit current rating of panelboard.
4. Features, characteristics, ratings, and factory settings of individual protective devices and auxiliary components.

D. Wiring diagrams detailing schematic diagram including control wiring, and differentiating between manufacturer-installed and field-installed wiring.

E. Qualification data for field-testing organization certificates, signed by the Contractor, certifying that the organization complies with the requirements specified in Quality Assurance below. Include list of completed projects with project names, addresses, and names of Architect and Owner plus basic organization qualifications data.

F. Report of field tests and observations certified by the testing organization.

G. Panel schedules for installation in panelboards. Submit final versions after load balancing.

H. Maintenance data for panelboard components, for inclusion in Operating and Maintenance Manual specified in Division 1 and in Division 16 Section "Basic Electrical Requirements." Include instructions for testing circuit breakers.

1.5 QUALITY ASSURANCE

A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

1. The terms "listed" and "labeled" shall be defined as they are in the National Electrical Code, Article 100.

2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

B. Field-Testing Organization Qualifications: To qualify for acceptance, the testing organization must demonstrate, based on evaluation of organization-submitted criteria conforming to ASTM E 699, that it has the experience and capability to conduct satisfactorily the testing indicated.

C. Electrical Component Standard: Components and installation shall comply with NFPA 70, "National Electrical Code."

D. NEMA Standard: Comply with NEMA PB1, "Panelboards."

E. UL Standards: Comply with UL 61, "Panelboards," and UL 50, "Cabinets and Boxes."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. ABB Power Distribution, Inc.
2. American Circuit Breaker Corp.
3. Asco Electrical Products Co., Inc.
4. Challenger Electrical Equipment Corp.
5. Crouse-Hinds Distribution Equipment.
6. Eaton Corp.
7. General Electric Co.

8. GTE Sylvania Lighting.
9. Siemens Energy & Automation, Inc.
10. Square D Co.
11. Wadsworth Electric Mfg. Co., Inc.
12. Westinghouse Electric Corp.

2.2 PANELBOARDS, GENERAL REQUIREMENTS

A. Overcurrent Protective Devices (OCPDs): Provide type, rating, and features as indicated. Comply with Division 16 Section "Overcurrent Protective Devices," with OCPDs adapted to panelboard installation. Tandem circuit breakers shall not be used. Multipole breakers shall have common trip.

B. Enclosures: Cabinets, flush or surface mounted as indicted. NEMA Type 1 enclosure, except where the following enclosure requirements are indicated.

1. NEMA 3R: Raintight.
2. NEMA 3S: Raintight and dust tight.
3. NEMA 4X: Corrosion-resistant fiberglass enclosure, watertight, dust tight, and resistant to oil and coolant seepage.
4. NEMA 12: Dust tight, dripproof, and resistant to oil and coolant seepage.

C. Front: Secured to box with concealed trim clamps except as indicated. Front for surface-mounted panels shall be same dimensions as box. Fronts for flush panels shall overlap box except as otherwise specified.

D. Directory Frame: Metal, mounted inside each panel door.

E. Bus: Hard drawn copper of 98 percent conductivity.

F. Main and Neutral Lugs: Compression type.

G. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors. Bonded to box.

H. Service Equipment Approval: Listed for use as service equipment for panelboards having main service disconnect.

I. Special Features: Provide the following features for panelboards as indicated.

1. Isolated Equipment Ground Bus: Adequate for branch-circuit equipment ground conductors; insulated from box.
2. Hinged Front Cover: Entire front trim hinged to box with standard door within hinged trim cover.
3. Split Bus: Vertical bus of indicated panels divided into two vertical sections with connections as indicated.
4. Skirt For Surface-Mounted Panels: Same gage and finish as panel front with flanges for attachment to panel, wall, and floor.

5. Contactors in Mains: Mechanically held, with current rating, poles, and connections as indicated. Conform to Division 16 Section "Motor Controller," except omit overload protection.

6. Control Power Source: Control power transformer of capacity indicated, for contactor shunt trip or other devices. Mount in cabinet of panel indicated. Protect primary with current- limiting OCPD as indicated. Provide fused protection of control circuits.
7. Extra Gutter Space: Dimensions and arrangement as indicated.
8. Gutter Barrier: Arranged to isolate section of gutter as indicated.
9. Auxiliary Gutter: Conform to UL 870, "Wireways, Auxiliary Gutters and Associated Fittings."
10. Column-Type Panelboard Configuration: Narrow cabinet extended as wireway to overhead junction box equipped with ground and neutral terminal buses.
11. Subfeed: OCPD or lug provision as indicated.

J. Feed-Through Lugs: Sized to accommodate feeders indicated.

K. Surge Arresters: IEEE C62.11, "Standards for Metal-Oxide Surge Arresters for AC Power Circuits," or IEEE C62.1, "Surge Arresters for Alternating Current Power Circuits."

1. Description: Coordinate impulse sparkover voltage with system circuit voltage and provide factory mounting with UL-recognized mounting device.

2.3 LOAD CENTERS

A. Provide load-center-type panelboards only where specifically indicated.

1. General: Conform to above article "Panelboards, General Requirements" except as follows:

B. OCPDs: Plug-in full module [nominal 1-inch (25 mm) width] circuit breaker.

C. Circuit Breakers for Switching Lights at Panelboards: Indicated type SWD.

D. Circuit Breakers for Equipment Marked HCAR Type: Indicated HCAR type.

E. Interiors: Provide physical means to prevent installation of more OCPDs than the quantity for which the enclosure was listed.

F. Main, Neutral, and Ground Lugs and Buses: Have mechanical connectors for conductors.

2.4 LIGHTING AND APPLIANCE BRANCH CIRCUIT PANELBOARDS

A. Branch OCPDs: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

B. Double-Width Panels: Where more than 42 poles are indicated or where otherwise indicated, provide two panelboards under single front.

C. Doors: In panel front, with concealed hinges. Secure with flush catch and tumbler lock, all keyed alike.

2.5 DISTRIBUTION PANELBOARDS

A. Doors: In panel front, omit single panelboard door in cabinet front for fusible switch panelboards except as indicated. Secure with vault-type with tumbler lock, all keyed alike.

B. Branch-Circuit Breakers: Where OCPDs are indicated to be circuit breakers, use bolt-on breakers except circuit breakers 225-ampere frame size and greater may be plug-in type where individual positive locking device requires mechanical release for removal.

C. Motor Starter Branches: Conform to Division 16 Section "Motor Controllers" and provide units equipped for panelboard mounting. Include the following accessories and pilot devices as indicated:

1. Individual control power transformers.
2. Fuses for control power transformers.
3. Pilot lights.
4. Extra interlock contacts.
5. Pushbuttons.
6. Selector switches.

D. Motor Starter Disconnects: Include overcurrent protection as indicated. Mount integral with or, in same panelboard, adjacent to motor starter. Mechanically interlock starter door with disconnect device. Provide auxiliary contacts on disconnect to deenergize control connections to starter.

2.6 ACCESSORY COMPONENTS AND FEATURES

A. Accessory Set: Include tools and miscellaneous items as required for overcurrent protective device test, inspection, maintenance, and operation.

B. Portable Test Set: Arranged to permit testing of functions of solid-state trip devices without removal from panelboard.

2.7 IDENTIFICATION

A. General: Refer to Division 16 Section "Electrical Identification" for labeling materials.

B. Panelboard Nameplates: Engraved laminated plastic or metal nameplate for each panelboard mounted with epoxy or industrial cement or industrial adhesive.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install panelboards and accessory items in accordance with NEMA PB 1.1, "General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less" and manufacturers' written installation instructions.

B. Ground Fault Protection: Install panelboard ground fault circuit interrupter devices in accordance with installation guidelines of NEMA 289, "Application Guide for Ground Fault Circuit Interrupters."

C. Mounting Heights: Top of trim 74 inches (1880 mm) above finished floor, except as indicated.

D. Mounting: Plumb and rigid without distortion of box. Mount flush panels uniformly flush with wall finish.

E. Circuit Directory: Typed and reflective of final circuit changes required to balance panel loads. Obtain approval before installing.

F. Install filler plates in unused spaces.

G. Provision for Future Circuits at Flush Panelboards: Stub four 1-inch (25 mm) empty conduits from panel into accessible ceiling space or space designated to be ceiling space in future. Stub four 1-inch (25 mm) empty conduits into raised floor space or below slab other than slabs on grade.

H. Auxiliary Gutter: Install where a panel is tapped to a riser at an intermediate location.

I. Wiring in Panel Gutters: Train conductors neatly in groups, bundle, and wrap with wire ties after completion of load balancing.

3.2 IDENTIFICATION

A. Identify field-installed wiring and components and provide warning signs in accordance with Division 16 Section "Electrical Identification."

3.3 GROUNDING

A. Connections: Make equipment grounding connections for panelboards as indicated.

B. Provide ground continuity to main electrical ground bus indicated.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals, including grounding connections, in accordance with manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

A. Testing Organization: Arrange and pay for the services of an electrical testing organization in to perform tests on low-voltage power panelboards and accessories.

B. Pretesting: Upon completing installation of the system, perform the following preparations for independent tests:

1. Make insulation resistance tests of panelboard buses, components, and connecting supply, feeder, and control circuits.
2. Make continuity tests of circuits.
3. Provide set of Contract Documents to test organization. Include full updating on final system configuration and parameters where they supplement or differ from those indicated in original Contract Documents.

C. Quality Control Program: Conform to the following:

1. Procedures: Make field tests and inspections and prepare panelboard for satisfactory operation in accordance with manufacturer's recommendations and these specifications.
2. Schedule tests with at least one week in advance notification.

3. Reports by Testing Organization: Report written reports of tests and observations. Report defective materials and workmanship and unsatisfactory test results. Include records of repairs and adjustments made.
4. Labeling: Upon satisfactory completion of tests and related effort, apply a label to tested components indicating results of tests and inspections, responsible organization and person, and date.

5. Protective Device Ratings and Settings: Verify indicated ratings and settings to be appropriate for final system configuration and parameters. Where discrepancies are found, recommend final protective device ratings and settings. Use accepted ratings or settings to make the final system adjustments.

D. Visual and Mechanical Inspection: Include the following inspections and related work:

1. Inspect for defects and physical damage, labeling, and nameplate compliance with requirements of up-to-date drawings and panelboard schedules.
2. Exercise and perform of operational tests of all mechanical components and other operable devices in accordance with manufacturer's instruction manual.
3. Check panelboard mounting, area clearances, and alignment and fit of components.
4. Check tightness of bolted electrical connections with calibrated torque wrench. Refer to manufacturer's instructions for proper torque values.
5. Perform visual and mechanical inspection and related work for overcurrent protective devices as specified in Division 16 Section "Overcurrent Protective Devices."

E. Electrical tests: Include the following items performed in accordance with manufacturer's instruction:

1. Insulation resistance test of buses and portions of control wiring that disconnected from solid-state devices. Insulation resistance less than 100 megohms is not acceptable.
2. Ground resistance test on system and equipment ground connections.
3. Test main and subfeed overcurrent protective devices in accordance with Section "Overcurrent Protective Devices."

F. Retest: Correct deficiencies identified by tests and observations and provide retesting of panelboards by testing organization. Verify by the system tests that the total assembly meets specified requirements.

3.6 CLEANING

A. Upon completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

3.7 COMMISSIONING

A. Balancing Loads: After Substantial Completion, but not more than two months after Final Acceptance, conduct load-balancing measurements and circuit changes as follows:

1. Perform measurements during period of normal working load as advised by the Owner.
2. Perform load-balancing circuit changes outside the normal occupancy/working schedule of the facility. Make special arrangements with Owner to avoid disrupting critical 24-hour services such as FAX machines and on-line data processing, computing, transmitting, and receiving equipment.

3. Recheck loads after circuit changes during normal load period. Record all load readings before and after changes and submit test records.
4. Tolerance: Difference between phase loads exceeding 20 percent at any one panelboard is not acceptable. Rebalance and recheck as required to meet this minimum requirement.

B. Infrared Scanning: After Substantial Completion, but not more than two months after Final Acceptance, perform an infrared scan of each panelboard. Remove fronts to make joints and connections accessible to a portable scanner.

C. Follow-up Infrared Scanning: Perform one additional follow-up infrared scan of each panelboard 11 months after the date of Substantial Completion.

D. Instrument: Use an approved infrared scanning device designed to measure temperature or detect significant deviations from normal values. Provide calibration record for device used.

E. Record of Infrared Scanning: Prepare a certified report identifying panelboards checked and describing results of scanning. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION 16470

SECTION 16510 - INTERIOR BUILDING LIGHTING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Extent of interior lighting fixture work is indicated on the Delivery Order.

B. Types of interior lighting fixtures in this section include the following:

1. Fluorescent.

C. Applications of interior lighting fixtures required for project include the following:

1. General lighting.

1.02 QUALITY ASSURANCE:

A. Manufacturers: Firms regularly engaged in manufacture of interior lighting fixtures of types and ratings required, whose products have been in satisfactory use in similar service for not than 5 years.

B. Installer: Specialist with at least 3 years of successful installation experience on projects with interior lighting fixture work similar to that required for project.

C. NEC Compliance: Comply with NEC as applicable to installation and construction of interior building lighting fixtures.

D. NEMA Compliance: Comply with applicable requirements of NEMA Std Pub Nos. LE 1 and LE 2 pertaining to lighting equipment.

E. ANSI/IES Compliance: Comply with ANSI 132.1 pertaining to interior lighting fixtures.

F. ANSI/UL Compliance: Comply with ANSI/UL standards pertaining to interior lighting fixtures for hazardous locations.

G. UL Compliance: Provide interior lighting fixtures which have been UL-listed and labeled.

H. CBM Labels: Provide fluorescent-lamp ballasts which comply with Certified Ballast Manufacturers Association standards and carry the CBM label.

I. NFPA: Provide emergency and exit marker lighting fixtures that comply with NFPA requirements.

1.03 SUBMITTALS:

A. Product Data: Submit manufacturer's data on interior building lighting fixtures.

1. Include electrical ratings, wiring diagrams, and photometric data with certified results of independent laboratory tests conducted in accordance with specifications.

B. Manuals: Prior to final inspection, provide complete set of operating and maintenance manuals. Include technical data sheets and parts ordering information.

PART 2 - PRODUCTS

2.01 INTERIOR LIGHTING FIXTURES:

A. General: Provide lighting fixtures, of sizes, types and ratings indicated; complete with, but not necessarily limited to, housings, lamps, lamp holders, reflectors, ballasts, starters and wiring.

1. Housings: Form fixture sheet metal housings to prevent warping and sagging. Return or clean all edges free of all burrs or sharp spots.

2. Hinged door closure frames shall operate smoothly without binding. Fabricate frames to allow lamp installation/removal without tools. Hinge mechanism shall be designed to preclude accidental falling of hinged door closure frames during relamping operations and while secured in operating position.

3. Interior light reflecting surfaces shall have reflectance of not less than 85% for white surfaces, 83% for specular surfaces, and 75% for specular diffusing surfaces.

4. Metal finishes: Provide manufacturer's standard finish applied over corrosion resistant primer, free of streaks, runs, holidays, stains, blisters, or similar defects. Remove any fixtures showing evidence rust at time of final inspection.

5. Fixtures shall be free of light leaks following installation.

B. Lamp Sockets:

1. Fluorescent: Comply with applicable provisions of UL 542 and ANSI C 81.

C. Safety: Mark light fixtures required to be operated in severe environmental conditions such as insulated ceilings, damp enclosures, vaportight enclosures with appropriate UL labels.

D. Light Transmitting Components:

1. Fabricate of 100% virgin acrylic plastic or water white, annealed, crystal glass.

E. Fluorescent-Lamp Ballasts: Provide standard core-coil, high efficiency fluorescent-lamp ballasts, capable of operating lamp types indicated; with high power factor, rapid-start, and low-noise features; Type 1; Class P; sound-rated A, and with internal thermal protection.

F. Interior Lighting Fixture Types:

1. Type A: 1' by 4' recessed white fluorescent fixture with injection molded, virgin acrylic, lowbrightness, prismatic frameless lens for use with two 40-watt lamps. Equip with plaster frame for installation in plaster ceilings and "fit in" trim for installation in acoustic tile.

2. Type B: 1' x 4' surface-mounted white fluorescent fixture with injection molded, virgin acrylic, lowbrightness, prismatic, frameless lens for use with two 40-watt lamps.

3. Type C: 1' x 4' surface-mounted white fluorescent strip fixture for use with two 40-watt lamps.

4. Type C-1: 2' x 4' surface-mounted white fluorescent strip fixture for use with two 40-watt lamps.

PART 3 - EXECUTION

3.01 INSTALLATION OF INTERIOR LIGHTING FIXTURES:

A. Install interior lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of NEC, NECA's "Standard of Installation", NEMA standards, and with recognized industry practices to ensure that lighting fixtures fulfill requirements.

B. Coordinate with other electrical work as appropriate to properly interface installation of interior lighting fixtures with other work.

C. Fasten fixtures securely to indicated structural support; and check to ensure that solid pendant fixtures are plumb.

3.02 ADJUST AND CLEAN:

A. Clean interior lighting fixtures of dirt and debris upon completion of installation.

B. Protect installed fixtures from damage during remainder of construction period.

3.03 FIELD QUALITY CONTROL:

A. Upon completion of installation of interior lighting fixtures, and after building circuitry has been energized, apply electrical energy to demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting. Contractor shall give Contracting Officer advance notice of dates and times for all field tests.

B. At the time of Substantial Completion and prior to field tests, replace lamps in interior lighting fixtures which are observed to be noticeably dimmed after Contractor's use and testing, as judged by Contracting Officer. Furnish stock or replacement lamps amounting to 15% (but not less than one lamp in each case) of each type and size lamp used in each type fixture. Deliver replacement stock as directed to Government's storage space.

3.04 GROUNDING:

A. Provide tight equipment grounding connections for each interior lighting fixture installation where indicated.

END OF SECTION 16510